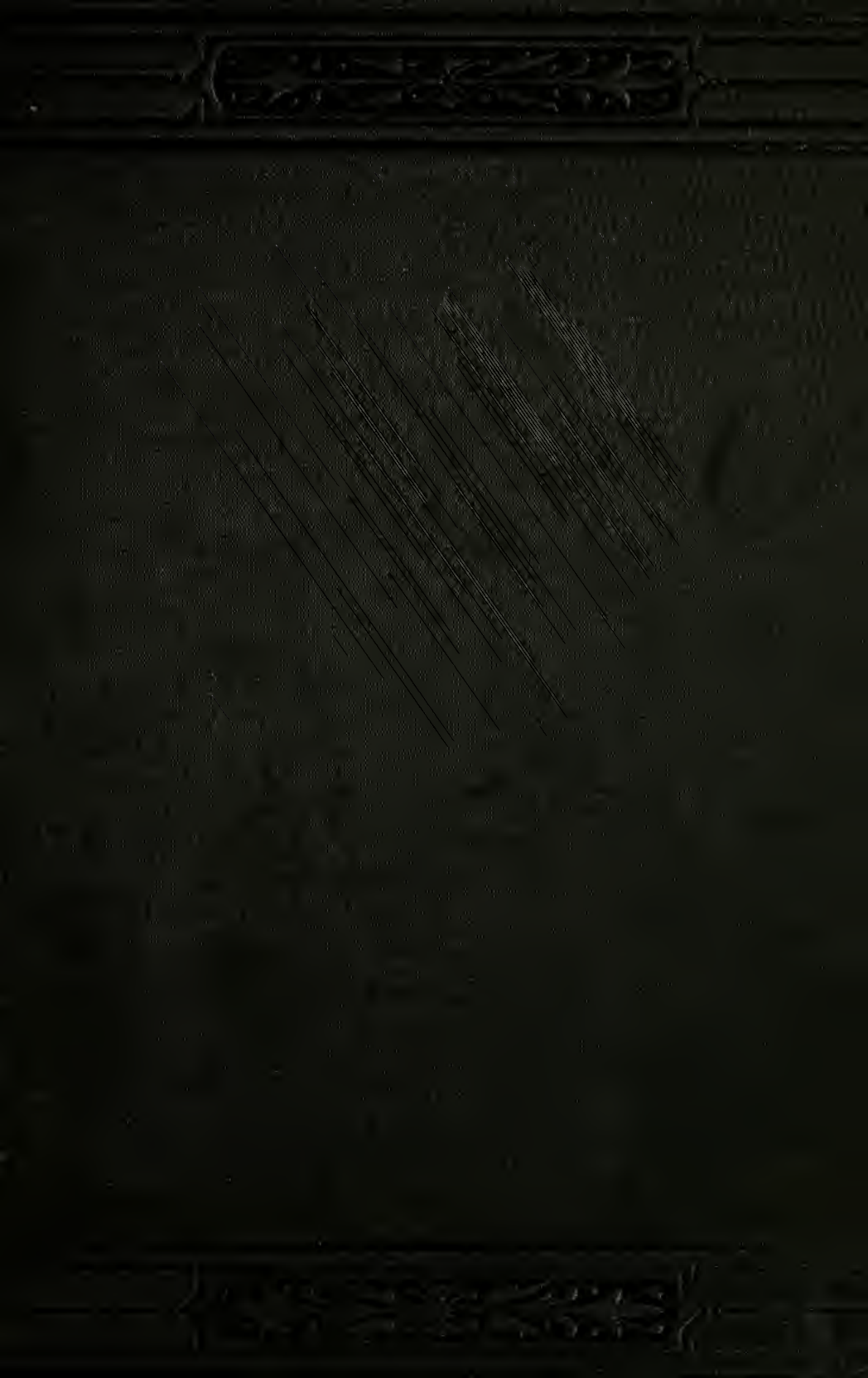

TRANSACTIONS

OF THE

FOURTH ANNUAL MEETING

OF THE

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

HELD IN

PITTSBURGH, PA.

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TABLE OF CONTENTS.

PAGE.

Address of the President, Wm. H. Daly, M.D. 1

PAPERS.

I. The Relation between Diseases of the Nose and Naso-Pharynx and Middle-Ear Inflammation. Edward B. Dench, M.D. 4
Discussion 11

II. Hemorrhage of the Larynx, with Cases. Howard S. Straight, M.D. 15
Discussion 20

III. Perichondritis of the Larynx; with Report of Two Cases, and the Description of a New Tracheotomy Tube. By George L. Richards, M.D. 24

IV. Rhinoliths. J. F. Hill, M.D. 35
Discussion 36

V. Dysphonia. Relief with the Use of the Galvanic Current. T. C. Christy, M.D. 38
Discussion 48

VI. Modern Possibilities in Chronic Catarrhal Deafness. Sargent F. Snow, M.D. 49
Discussion 55

VII. A Case of Rhino-Pharyngeal Fibroma with Projections Extending to Both Anterior Nares. H. W. Loeb, M.D. .. 58

VIII. Primary Epithelioma of the Antrum of Highmore, with History of a Case and Two Camera-Lucida Drawings. Wendell C. Phillips, M.D. 61

IX. Sarcoma of the Nasopharynx, with Report of a Case. D. A. Hengst, M.D. 78

X. (1) Gumma of Pharynx. (2) Rheumatic Pharyngitis. Geo. T. Ross, M.D. 82

XI. A Study of Thirty Cases of Antral Empyemia. Frederick C. Cobb, M.D. 86

XII. Chronic Inflammation of the Pharyngeal Tonsil, with Little Hypertrophy. Chas. N. Cox, M.D. 91
Discussion 93

XIII. Remarks on Surgical Treatment in Caries of the Nose and Ear. H. L. Wagner, M.D. 97

XIV. Acute Suppuration of the Middle Ear. James E. Logan, M.D. 93
Discussion 104

XV. Three Cases of Intracranial Abscess. James F. McKernon, M.D. 111
Discussion 124

XVI. Recurrent Papilloma of the Larynx; Report of Two Cases in Which Alcohol Was Used in the Treatment. T. H. Halsted, M.D. ... 126
Discussion ... 133
XVII. Report of Two Cases of the So-Called Eunuchoid Voice. F. H. Koyle, M.D. ... 135
XVIII. Deductions from a Study of Unilateral Nasal Stenosis. Lewis A. Coffin, M.D. ... 140
Discussion ... 143
XIX. The After-Treatment of Restored Deflected Nasal Septum. Chas. W. Richardson, M.D. ... 144
Discussion ... 146
XX. (1) Basil and Basilateral Diseases of the Faucial Tonsils, with Improved Instruments for Treatment of Same. (2) Report of Two Cases of Nasal Adhesive-Tissue Stenosis, Congenital, and Scarlatinal. Robert C. Myles, M.D. 151–158
XXI. Some Anatomical Points on the Structure of the Lingual Tonsil of Practical Bearing on Its Pathology. By Lennox Browne, F.R.C.S. ... 161
XXII. Report of Two Cases Illustrating the Negative Value of Transillumination in Antrum Diseases. H. Holbrook Curtis, M.D. ... 167
XXIII. Serious Consequences Following Intranasal Operations. Robert Levy, M.D. ... 169
XXIV. Treatment of Chronic Empyema, Maxillary Sinus. J. A. Stucky, M.D. ... 176
XXV. Perichondritis and Necrosis of the Arytenoid Cartilage. Wm. Scheppegrell, M.D. ... 178
XXVI. A Nasopharyngeal Polypus of Enormous Size. Max Thorner, M.D. ... 183
Discussion ... 185
XXVII. Othematoma and Chronic Perichondritis of the Auricle. John O. McReynolds, M.D. ... 188
XXVIII. Presentation of Instruments. Eustachian Cannula. Dr. Willets ... 191
A New Laryngoscopic Mirror and Method of Use. Dr. Curtis ... 192
Intubation with Improved Instruments. Dr. Thorner ... 193
Business Meeting. Obituary. Dr. Joseph O'Dwyer ... 197
List of Fellows ... 202

TRANSACTIONS

OF THE

FOURTH ANNUAL MEETING

OF THE

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY,

HELD IN PITTSBURG, PA., MAY 11 AND 12, 1898.

ADDRESS OF THE PRESIDENT,

W. H. DALY, M.D.

GENTLEMEN: I have much honor and pleasure in bidding you a hearty welcome to our city. I am sure you will all experience an agreeable surprise, on this your first visit here, since the just reputation of Pittsburg being a vast manufacturing center, has also made it to be regarded, as only remarkable for that distinction; but you will, notwithstanding, also find other things of vast proportions, that will appeal to your higher and esthetic senses.

Here we have hundreds of acres of public parks, just now presenting an unexcelled beauty of hill, and dale, and vista. The public conservatory of plants, a present from a generous citizen, Henry Phipps, is equal to the best in the country; and Carnegie Music Hall, Library, and Museum, a gift of the noble Pittsburger whose name it bears, is in keeping with the most liberal expenditure, and advanced taste of this wonderful age. Without overstepping the bounds of modesty, we may say Pittsburg, therefore, like good, old wine, "needs no bush," and, while you have brought us rich presents of scientific value in learned lore, as indicated in the charming programme before us, reaching, as it does, from our distinguished confrère, Lennox Browne of London, to Massei of Naples, with other learned lights in our profession from the great cities of our own land. We, with grateful

hearts, your Pittsburg members, through me, thank you deeply for having honored us. We are twice honored, in fact as well as in sentiment, for it was in this city, two years ago, that the older national organization of laryngologists, which we all revere, for its high scientific work, met, with just the same number of papers to be read and discussed, viz.: thirty-four, and, also, with your present speaker as its President. Truly, Pittsburg has been honored, and your speaker placed under a debt of gratitude, for the kindliest partiality, and consideration, that any man can ever receive from distinguished confrères, whose names are as household words, in all the higher planes of thought, in laryngology, rhinology, and otology. What more can I say, than to express a personal pride to you in being, as you are well aware of, unsolicited on my part, called to the office of your President? This honor is all the more touching, since the membership is largely made up of the young men, whose names are not only the glory and pride of laryngology, but men whose writings and discussions are read with avidity, that speaks without saying it, that they are of the highest scientific and analytical value.

Now, gentlemen, if I have seemed to speak to you with much freedom of commendation, I can only say, as one of the older laryngologists, "Yet we are only a trifle older, but not better soldiers," and we are older and younger as one—proud and determined to carry onward our lines of advance, wherever we are placed, so that the coming unfolding of the twentieth century will find that we, too, have a right to our names high up on the roll of honor, for work well done, for studies well prosecuted, and for solid results in the preservation of human health, even though our work be done, unheralded by the blare of trumpets, or without the knowledge of the great outside unthinking world, who look, alas, too often, upon the Medical Man, as some one whose aid is sought to enable the patient to indulge in habits, excesses, and exposures not meant for thinking human beings; but if we have any doubt as to whether modest scientific labor is unrewarded, let us all remember that dear, good man, Dr. Wilhelm Meyer of Copenhagen, Denmark, whose close friendship it was my esteemed privilege to enjoy through many years previous to his death. His life was pure, his mind was that of a deep thinker, yet his manner as gentle as a child's.

I once heard Sir Morell Mackenzie say at a banquet of laryngologists in Denmark, that before Newton lived apples had fallen to the ground, and before Wilhelm Meyer lived pharyngeal

adenoids had existed, but the significance of these facts awaited an interpretation by two great minds. Wilhelm Meyer literally died in the harness, from pneumonia, contracted from exposure in the damp tombs and crypts of Italy, where he had gone in his old age to study afresh among the tombs of the ancients, the evidence of pharyngeal adenoids as depicted by the separated lips of the sculptured images of the dead of past ages.

A letter I just received from his aged widow, now residing in Venice, is filled with grateful appreciation of the spontaneous outflow of money from the profession of the greater civilized nations, which culminated in the erection of a monument to the memory of Wilhelm Meyer in his native city. I am proud for America, that her sons in medicine contributed most nobly, and I am also happy that I, as President of the older national body of laryngologists, set the work on foot, by appointing a large and able committee, in every city in America, headed by Dr. D. B. Delavan of New York, Dr. M. B. Ward being subchairman of the Pittsburg Committee. They more than fulfilled the best results that I promised for them to Felix Semon, and others, in London, and Denmark, who had there this sacred office in hand. Dr. Delavan's labors were considerable, covering, as they did, our entire country, and they were well and cheerfully done, as he, too, was a loving friend of the dead master.

The work in our several special lines has been so vast and efficient in the past year, that it is quite impossible for me to touch upon it in even a passing comment. A mere index of it would take hours to read, and I forbear, owing to the mass of excellent work now before us. America, however, as usual, has a large share of the solid, practical advance to her credit.

While we meet in the peaceful avocation of science, we are so small an integral part of a vast and mighty nation, that we scarcely see anything here to remind us of the clash, pomp, and circumstance of grim war Yet I am sure that others here, possibly all, have, from patriotic motives, like myself, placed themselves on call from their country, should they be needed for the good of the service and the nation.

The speaker, being probably the oldest here, had experience from the first to the last of the war for the Union, and knows only too well its exposures and trials, but should he or any of us be needed, we are ready to go and to do our duty wherever we may be of the most efficient service to our country's flag and the cause of freedom. In the meantime, while others of our

countrymen are now carrying the banner, and impatiently awaiting the order to forward! march! let us improve our qualifications, by earnestly listening to the bright scientific essays that are here to be read and discussed, and I now to that end declare this our Fourth Annual Congress open, and bid you godspeed and much mental benefit.

PAPER:

THE RELATION BETWEEN DISEASES OF THE NOSE AND NASO-PHARYNX, AND MIDDLE-EAR INFLAMMATION.

BY EDWARD B. DENCH, M.D.

At the present time, a paper upon this subject seems almost unnecessary, as every one recognizes the influence which pathological conditions in the nose and naso-pharynx exert upon the middle ear. The intimate anatomical association between these two regions sufficiently explains this fact. Ever since Meyer, in 1869, demonstrated the marvelous improvement in hearing effected by removal of adenoid vegetation from the naso-pharynx, the subject under discussion has claimed more and more attention. Indeed, within the last few years, it seems to me, that there has been a tendency to overestimate the influence which obstructive lesions of the upper air tract exert upon inflammatory processes within the tympanum. This is especially true regarding the improvement which may be expected in chronic middle-ear inflammation, as the result of local treatment of the upper air-passages. No one, for an instant, denies the fact that the presence of adenoid vegetations, of enlarged tonsils, or of nasal obstruction, due either to hypertrophic rhinitis, septal deformity, or nasal polypi, is an exceedingly potent factor in causing repeated attacks of acute inflammation of the tympanum. Where these conditions are particularly well marked, the slightest exposure to cold, causing a congestion of the mucous membrane of the nose and naso-pharynx, is sufficient to bring on a corresponding condition within the tympanum. The intimate relation which exists between the venous supply of the middle ear and that of the nose and naso-pharynx, makes it impossible for a hyperemia to occur in one region, without producing a corresponding condition in the other. In the milder cases, the aural lesion may not constitute a true in-

flammation, the condition being one of venous congestion. If this engorgement persists for a sufficient length of time, there is a transudation of serum through the walls of the blood-vessels, filling the middle ear with fluid. The name, *otitis media serosa,* has been improperly applied to this condition. The effused fluid is not the result of an inflammatory process, but of venous stasis. When the engorgement in the upper air-passages disappears, these cases frequently recover spontaneously, the fluid within the tympanum being absorbed. In other instances, the blood-vessels of the tympanum do not regain their proper tone, and the effusion in the middle ear remains, causing a permanent impairment in the hearing

In some cases, the interference with the circulation is not sufficient to cause an effusion of fluid in the middle ear. Instead of this, the mucous membrane lining the cavity becomes the seat of a slowly progressive chronic inflammation; the connective tissue gradually becomes thickened, this thickening being most marked usually, in the upper portion of the tympanic cavity, and about the oval and round windows. The Eustachian tube is affected in a similar manner. As the disease advances, the walls of the tube become thickened, and its caliber correspondingly diminished; in other words, we have developed a chronic catarrhal otitis media, a disease which is slowly progressive, involving usually one side more than the other, and steadily impairing the power of audition. This same condition of hypertrophic catarrhal inflammation of the middle ear may follow repeated attacks of acute inflammation, although this is rather rare, the disease, being as a rule, chronic from the first. As the disease advances, the newly deposited tissue becomes more firm and dense, owing to the disappearance of its cellular elements. When this occurs, the Eustachian tube, instead of being narrow, becomes more patent than normal, owing to the atrophy of its connective-tissue lining.

A similar change in the reduplications of the mucous membrane in the oval niche causes an increased rigidity of the stapes. In advanced cases the stapedio-vestibular joint becomes either completely or partially ossified. Similar folds in the niche of the round window reduce the elasticity of the *membrana tympani secundaria.*

These, briefly, are the changes which may take place in the middle ear, as the result of stenosis of the upper air tract.

When we come to consider the benefit to audition which may be expected, by restoring the air-passages to their normal

condition we find that this depends upon the character of the aural lesion. The first class of cases which were mentioned were those either of acute inflammation of the middle ear or of acute middle-ear congestion. These cases are especially common in children, and are most frequently associated with adenoid vegetations in the naso-pharynx. We might naturally think that the severity of the aural symptoms would depend somewhat upon the degree of obstruction to nasal respiration. This, however, is not the case. Quite frequently, a very moderate lymphatic hypertrophy in the pharyngeal vault is sufficient to cause the severe aural symptoms. On the other hand, I have seen the pharyngeal tonsil greatly hypertrophied, with no history of any ear trouble. It must be remembered that in childhood particularly, even a slight congestion of the lymphatic tissue in the pharyngeal vault is sufficient to cause it to increase in volume to a very marked degree. In a number of cases, I have noticed that when the patient was free from cold, there was very little hypertrophy of the pharyngeal tonsil. When, however, this tissue became congested, it increased to twice or three times its normal size, and such an augmentation of volume was always followed by aural symptoms, such as impairment in hearing, earache, tinnitus, etc. Repeated attacks of this character naturally lead to those chronic changes in the mucous membrane of the middle ear which have been previously described. I have said that this statement applies particularly to children. Not infrequently, however, we find a moderate hypertrophy of the pharyngeal tonsil in young adults, and here recurrent aural symptoms are not infrequent as the result of this hyperplasia.

The treatment of these cases is naturally, exceedingly simple. The naso-pharynx should be completely cleared of all lymphatic tissue by means of the forceps and curette. Many claim that this operation can be satisfactorily performed, especially in older children or in young adults, without the administration of an anesthetic. I can only say that my own experience has led me to employ general anesthesia invariably in dealing with this condition. If we expect improvement after the operation, the procedure must be thorough, as even if a small amount of the growth remains, it may be sufficient to cause pronounced symptoms. In children over eight years of age, and in young adults, I have of late employed nitrous oxide for the production of general anesthesia. It is usually possible to remove the entire mass under one administration of the anesthetic. In difficult cases, how-

ever, it may be necessary to repeat the anesthesia a second or even a third time, and the possibility of this is always explained to the patient beforehand. When this plan of treatment has been followed it has been entirely successful in every case. I do not remember a single instance in which a patient has suffered either from an acute inflammation of the middle ear, or even from a simple congestion of the tympanum, after the operation. We are justified, therefore, in promising that these cases will be completely relieved upon removal of the adenoid tissue from the nasopharynx.

In childhood the duration of the aural symptoms seems to exert but little influence upon the prognosis. A case recently came under my observation, with the following history: The patient was a child about eight years of age. The hearing had been greatly impaired on one side for more than a year, and in addition, the patient suffered severely from vertigo An unfavorable prognosis had been given by the medical adviser who had first seen the case. On examination, I found no evidence of labyrinthine or auditory-nerve involvement, the affection being limited to the middle ear. There was a large adenoid growth in the pharyngeal vault, and I felt justified in promising great relief upon removal of the mass. The case was operated upon, and ten days later, the hearing was absolutely normal, and the vertigo had entirely disappeared.

While operative treatment is almost universally successful in children, the same cannot be said of the procedure in older patients. In early life, newly deposited tissue is exceedingly vascular, and easily absorbed, if the cause of the deposit is removed. This rule applies, practically, up to the age of puberty. Beyond this period, hyperplastic changes yield less readily to treatment, owing to the increased density of the newly deposited tissue. It is absurd, therefore, to promise an adult, suffering from a hyperplastic inflammation of the middle ear, that he will obtain complete relief on the restoration of the upper air-passages to their normal condition.

The structural changes which have taken place in the middle ear are practically permanent by the time the patient reaches adult life, and, even if we grant that the cause of these changes was an obstructive lesion of the upper air tract, and that this condition is still present, it is hardly reasonable to suppose that the removal of the cause will effect a complete absorption of the hypertrophic deposit. It is in these cases particularly, that the rhinolo-

gist so often errs in giving a favorable prognosis as the result of treatment of the upper air tract. There is no question as to the advisability of restoring the nasal passages to their normal patency, and of relieving any inflammatory process affecting the naso-pharyngeal mucous membrane. The result may, in some cases, be obtained by mild local treatment, while, in others, surgical interference is imperative. Where treatment is confined to the upper air tract alone, no matter how skillful this treatment may be, the results are, as a rule, disappointing. The most that can be promised, is that the patient will no longer suffer from recurrent attacks of subacute inflammation of the middle ear. In spite of this, however, the chronic inflammation in the tympanum may progress slowly, until the hearing becomes greatly impaired. It is absolutely necessary, in order to obtain the best results, that the treatment be directed not only to the upper air-passages, but to the middle ear as well. If the surgeon confines his efforts to the middle ear, the result will be unsatisfactory, on account of the constant tendency to recurrence, due to the condition of the upper air tract. On the other hand, if the upper air-passages are restored to a condition of perfect health, this, as before stated, will not affect, to any degree, the tissue changes which have already taken place within the middle ear. No *general rule* of treatment can be laid down, for the relief of these cases; no two are precisely alike. The surgeon must find out the exact cause of the impairment in hearing, and must then proceed accordingly. Probably no one term has done so much harm, as that of "*catarrhal deafness.*" Not only the laity, but the profession in general, seem to consider this a distinct disease, and assume that all cases coming under this category are to be treated in exactly the same manner. It would be quite as proper to lay down radical rules for the treatment of diseases of the knee-joint and to expect every case to improve under one single method of procedure.

I repeatedly see cases where the treatment of the upper air tract has been skillfully conducted, and the patient is told that nothing more can be done, that the hearing will grow no worse, but that there is no hope for further improvement. These cases have invariably improved under treatment of the middle-ear condition, the nose and throat having already been skillfully dealt with by some confrère.

I feel that a large proportion of my hearers will not agree with this statement, and will consider that I am discussing the subject form a purely otological point of view. I would not, for an in-

stant, underestimate the value of work done by the rhinologist, and, to prove this, wish to call attention briefly to a class of cases which are greatly improved by treatment of the throat and nose, and which are ordinarily considered not amenable to treatment. I refer to those cases of slight impairment in hearing frequently accompanied by tinnitus, occurring in individuals of middle life. The condition of the upper air tract, in these cases, is usually as follows: there is either a well-marked hypertrophic rhinitis, a septal deformity on one side, or a chronic naso-pharyngitis. Functional examination shows that the middle ear is unaffected. The lowest tones of the musical scale are well heard, bone conduction is slightly diminished, and the upper-tone limit is either normal or reduced. The whisper is heard better than the tick of the watch, and the impairment in hearing is chiefly noticed in general conversation, dialogue being carried on with perfect ease. The functional examination is characteristic of beginning labyrinthine disease. Upon relieving the hypertrophic rhinitis, however, and restoring free nasal respiration, the tinnitus is diminished, and the hearing is greatly improved. Many instances of this kind have come under my observation. If we recall the intimate association between the venous supply of the turbinated bodies and that of the labyrinth, through the pharyngeal plexus, it is easy to understand how engorgement of the turbinated tissue would lead to a venous stasis within the labyrinth. The restoration of the normal tonicity of the turbinated tissue relieves this intranasal venous congestion, and, in turn, corrects the interference with labyrinthine circulation.

The influence of the treatment of the upper air-passages upon a chronic discharge from the middle ear must also be considered. Speaking broadly, cases of otorrhea, dependent upon middle-ear disease, may be divided into two classes: first, those in which the discharge is purulent in character, and is always present; second, those cases in which the discharge is intermittent and is seromucus in character. In this last class of cases the discharge usually makes it appearance when the patient is suffering from a cold in the head. In the first class, those in which the discharge is constant, and the secretion is purulent in character, treatment of the upper air-passages offers practically no hope of relief. The otorrhea is dependent upon the caries within the middle ear, and relief can be obtained only by the removal of the diseased bone. The second class of cases, however, is very frequently met with, especially in young adults. Not infrequently, we find that the

tympanic membrane has been destroyed over a considerable area, and the internal wall of the middle ear exposed. The tympanic inflammation has practically run its course, and a spontaneous cure has taken place, with the exception that the drum membrane has not been replaced. When, now, these patients suffer from a cold in the head, the mucous membrane lining the middle ear becomes congested, and there is a certain amount of serous effusion. A similar condition would occur, if the drum membrane were present, and the case would be classed as one of *otitis media serosa,* alluded to in the early part of this paper. As the tympanum is freely exposed, however, the effusion finds its way into the canal, and we have an otorrhea. I have said that the discharge in these cases is sero-mucous in character. This is invariably the case in the early stages. If the ear is not properly cleansed, and this serous fluid is allowed to remain in the canal, it may be infected through the air, and become purulent. In those cases, where there is an obstructive lesion of the upper air tract, there is every reason to suppose that the aural symptoms will be greatly relieved by proper treatment of the nose and throat. This treatment would naturally render the patient less liable to successive colds in the head, and to repeated attacks of congestion of the mucous membrane of the upper air tract. This, in turn, would prevent successive attacks of tympanic congestion. It is a well-known fact that after the mucous membrane of the middle ear has been exposed to the air for a considerable length of time it acquires a certain amount of immunity to this exposure, and is not readily affected by slight vascular changes.

By preventing, then, these repeated attacks of tympanic congestion, these cases may be permanently relieved. If, on the other hand, the treatment is directed solely to the aural condition, without reference to the upper air tract, the results will be disappointing. Not only will there be a recurrence of the attacks, but there is danger of infection of the middle ear, through the discharge in the canal, thus setting up a purulent inflammation of the tympanic cavity.

It seems to me that the line can be very clearly drawn between those cases which can be benefited by treatment of the nose and throat, and those cases which will not be relieved by such a procedure.

I am well aware that I have stated nothing new in this paper, and it has simply been my effort to draw the line a little more

definitely between these two classes of cases with which we so frequently have to deal.

DISCUSSION.

Dr. Wendell C. Phillips, New York: I have nothing but words of commendation for Dr. Dench's paper. I agree with every statement, and do not rise to take issue with him, but simply to emphasize one or two points made in his paper. There is a class of cases of middle-ear catarrhal inflammation in young children, which seems to be typical, and due always to the presence of adenoid tissue in the vault, and I rarely hesitate to make the diagnosis of adenoids before resorting to a visual examination of the vault of the pharynx. The dull-red appearance of the drum giving one the impression that it is infiltrated—a color, indeed, hard to describe, but easily recognizable by the experienced eye, is present in nearly all cases of adenoids, except in cases where suppuration has occurred. Another point I would like to emphasize is the importance of making the examination of the vault with the mirror and not with the finger. I do not think it necessary to introduce the finger except in rare cases, and never if it is possible to avoid it. I rarely fail to use the rhinoscopic mirror in children.

You can do it successfully in ninety cases out of a hundred if you take care to distract the attention of the little patient from the fact that you are trying to do something to the throat. Another point I desire to emphasize is that the amount of inflammation in the ear is not always proportionate to the amount of obstruction in the postnasal space. A very small portion of adenoid tissue in the vault or a slight enlargement of the tonsil will often give rise to extensive inflammatory condition of the drum. This point is brought out in Dr. Dench's paper, and is sustained by my observation. The earlier the operation is done, the better for the child, and for this operation I wish to recommend the use of Brandegee forceps. With these forceps we are generally able to remove a large mass at one application. Another fact will bear out the statements of Dr. Dench in his most admirable paper, viz., that investigation has revealed that a large proportion of deaf-mutes give a history of adenoids. Such statistics as I have been able to collect would seem to indicate that about 57 per cent. of deaf-mutes have adenoids. Dr. Frankenberger of Prague, in examining 159 deaf-mutes, found adenoids in 60 per cent. of the boys and 55 per cent. of the girls. The mere statement seems to prove that this condition sustains a close causal relation to deaf-mutism. During the coming year I hope to be able to make some investigation upon this subject in the asylums in the vicinity of New York. Another thing that should be discussed in connection with this paper, and I called attention to it in a paper read before the Medical Society of the State of New York last January, is that, while we appoint medical

examiners for our public schools, chiefly to detect contagious diseases, we should also have those who are capable of determining defects of sight and hearing. Children with defective sight or hearing, and recent investigations go to prove that the latter are rather more common, should be given every advantage in the struggle for education.

Dr. Robert Levy, Denver, Col.: I am very much gratified to have been able to hear a paper on this subject by so eminent an authority as Dr. Dench. Besides being gratified, I have been very much encouraged in regard to some cases which I have discussed with some medical friends of mine, in which many of them took exception to my opinions. I think that in diseases of the upper air-tract, the nose and nasopharnyx are closely related to the development of the middle-ear troubles. They have performed almost all the harm they will do when this middle-ear disease becomes distinctly fixed. The pathological changes are marked and maintained so. It has always seemed to me that we only do a certain amount by relieving the nasal condition in preventing successive attacks of otitis, while we are doing little in the way of curing disease that already obtains. I would like to ask Dr. Dench, in reference to the administration of nitrous oxide, whether he administers the anesthesia at his office, at the hospital, or at the home of the patient, and in what manner he carries the gas about with him. I have used nitrous oxide for operations in the upper air-passages, especially in tonsillotomy. In adenoid operations, I operate either in the hospital or in the patient's home, preferably the former. The after-effects of the anesthesia, the blood, and all these things, can be better attended to than at the office. I would like also to ask Dr. Dench at what time he considers it best to operate, that is, a patient frequently presents himself with acute attack of otitis media. When is the proper time to operate upon the nose with particular reference to the ear operation? I am very glad that Dr. Dench cleared up one point in my mind, and that is with reference to the lymphatic engorgement in the nasopharynx from cold with a moderate amount of hypertrophy. I have not been in the habit of operating upon these cases, inasmuch as I consider the condition a temporary one and not permanent hypertrophy.

Dr. E. B. Dench, New York: So far as the place of operation is concerned, I never remove adenoids in my office. With reference to the proper time for operation, after an acute otitis media, I believe that the best time is almost immediately upon the subsidence of the acute symptoms. I have found that the depletion caused by the removal of the adenoids is quite efficient in relieving the congestion of the tissue due to the acute attack.

Dr. F. J. Quinlan, New York: According to my observations, Dr. Phillips' experience does not agree with mine. He says that always, or in the vast majority of cases, where there is hyperemia of the anterior membrana tympani, adenoid growths

are generally present. Now I must take issue with him on this point. I have watched this zone for several years past, in suspected cases, and I have not always found such a condition. Absolutely nothing of this character in a majority of cases was observed. I was very much interested in the discussion, and would like to ask the gentlemen present what their experience is regarding acute suppurative inflammations after operations upon the vault. I would solicit some expression of opinion on this point. It was my bad fortune recently to have a case of this kind where an acute suppurative attack commenced about two weeks after operation.

Dr. Howard S. Straight, Cleveland, O.: There is one question which Dr. Dench did not touch upon as much as I should have liked, that is, the fact that catarrhal deafness, according to my understanding, is almost invariably progressive. Of course, this may not be true in children, where little damage has been done, and the process may possibly be cut short and the damage to the ear stopped by correction of nasal or nasopharyngeal trouble; but in older people, from twenty to thirty or forty years of age, it is very doubtful if the correction of the nasal troubles will in any degree cure the ear trouble or stop the almost inevitable progression if the ear is hopelessly damaged. I do not believe ear trouble will be cured even by the removal of the original causative factor of the disease, whether the almost inevitable progression cannot be modified is the question. I hardly know what to tell patients when they come to me in this condition. I have either nothing to tell them, or else must inform them that the ear will never get any better, as this is undoubtedly true in many cases. My belief is that in spite of operation for the correction of nasal trouble, that catarrhal deafness is progressive, and that there is very little hope to hold out to these patients. Moreover, the connection of the nasal or nasopharyngeal disease is the only thing that offers any hope, and I am altogether in sympathy with such efforts, and yet, in justice to the patient and to *our art*, we would not lead our patient to expect too much from operative procedures in such cases.

Dr. Lewis C. Cline, Indianapolis, Ind.: I have listened with pleasure to the reading of this very able paper and the discussions which have taken place. There is one point which I have been very much struck with in my experience, and that is with regard to the faucial tonsil, although it may not be very much enlarged—not very much hypertrophied—in cases where complaint is made of tinnitus and noise, I have found that in many cases there was follicular trouble in the nostril, and by relieving this trouble and cleaning out the crypts thoroughly, very excellent results were obtained. There is one other point in reference to these cases of catarrhal complication, and that is, I think there is almost invariably some gastric condition that needs attention—some catarrhal disturbance of the stomach. If this point is looked

after thoroughly, there will often be a marked improvement in the ear trouble.

Dr. E. B. DENCH, New York: With reference to Dr. Phillips' remarks, would say that I agree with him as to the characteristic appearance of the membrane in cases of middle-ear inflammation, due to the presence of adenoid vegetations, but do not agree with him on some of the other things which he says. My experience is that the drum membrane is retracted—stretched and atrophied. I considered this condition very characteristic. So far as anesthesia is concerned, some men do these operations without it; for my part, I prefer to use a general anesthetic. I think Dr. Quinlan's case of suppurative otitis, following two weeks after an adenoid operation, was not due to the operation at all. It occurred too long after it, and was merely coincident. With reference to Dr. Straight's remarks, I do not think I understood him fully. There is no doubt about most cases of catarrhal deafness being progressive. They will undoubtedly progress if they are not treated, but they may get better if they are treated; and there are many cases of catarrhal deafness in which the throat trouble is merely coincident with and not the cause of the deafness. I did not understand exactly Dr. Logan's remarks. I believe he said that the ear was perfectly normal upon otoscopic examination.

Dr. LOGAN: I meant to say that where there was no general inflammatory condition, the condition did not show any evidence of a long-continued inflammatory process.

Dr. DENCH: Was the tube pervious?

Dr. LOGAN: Yes, it was previous.

Dr. DENCH: I fail to see how the case could be benefited by simply improving the ventilation of the middle ear.

Dr. LOGAN: The point is this: Where the air does not circulate freely through the nostrils, and where the tube is pervious, is there not an aspiration of the tympanum with each inspiration?

Dr. DENCH: It seems to me that in many of these cases there is some interference with the circulation within the middle ear also.

PAPER:

HEMORRHAGE OF THE LARYNX, WITH CASES.

BY HOWARD S. STRAIGHT, M.D.

Case I.—In February, 1898, an Englishman, aged 37 years, was referred to me for examination of the throat. Fourteen years before coming under observation, and while living in England, he had had a marked expectoration of blood that lasted two or three days and then ceased. For a few months following, he expectorated at times small quantities of blood. At this time his general health was in no respect affected, either before or following the hemorrhage. For seven years he had no recurrence of hemorrhage. About this time he came to this country. Seven years before coming under my observation, he had a recurrence of the hemorrhage, and during the next four years he had hemorrhages at intervals varying from a few weeks to a few months. For three years before coming under observation he had been much worse than at any other period of equal length during fourteen years. In December, 1895, after taking a severe cold, he had had a very profuse hemorrhage lasting for a number of days. For three weeks before his visit to me, he had an almost constant slight hemorrhage, being able to raise small masses of blood at almost any time by clearing his throat. This was especially true on rising. The patient was a strong, healthy, rosy-cheeked Englishman. At no time during the fourteen years since the occurrence of the first hemorrhage, had he lost flesh or strength or suffered in any way as to his general health. His family history was perfect. He had never suffered in any way from catarrhal troubles of the upper air-passages or larynx. His hemorrhages occurred without having any special reference to having a cold at time of bleeding. He gave no history of other hemorrhages. A general examination revealed nothing abnormal. Observation as to the pulse and evening temperature revealed nothing abnormal. An examination of his upper air-passages revealed a slight hypertrophic rhinitis only. An examination of his larynx revealed a general engorgement of the blood-vessels of the larynx, the epiglottis, and base of the tongue. No bleeding-point could be detected, although he had expectorated quite a little blood within a few hours before his visit to me, nor

could I detect any bleeding-point within the next two months, although he had a number of slight hemorrhages. One Monday morning, after singing at the church the night before, he had quite a profuse hemorrhage, but no bleeding-point could be detected, although I saw him in the middle of the forenoon. At the first visit I sprayed his throat with a weak solution of nitrate of silver. This treatment was repeated at first daily, and after three or four daily treatments, every second day for a short time. The improvement as to expectoration of blood was immediate. Also the engorgement of the blood-vessels was improved after a treatment or two. The reappearance of this engorgement of the vessels was noticeable after having sung in church, and the occurrence of the sharp hemorrhage the following morning. Upon continuance of the treatment as outlined, with rest of his voice and a slight cauterization of the lower turbinated bodies, the hemorrhage promptly disappeared, and after continuing this treatment for three weeks, I gave him a two-per-cent. solution of nitrate of silver to use as a laryngeal spray night and morning, and told him to report if he had more trouble. For two months he has had no hemorrhage whatever. From his history I believe that his hemorrhages were from the free surface of the larynx or adjoining parts of the throat, and that at no time had the hemorrhages occurred subcutaneously.

Case II.—In 1895, a man, aged thirty-five years, consulted me as to the origin of hemorrhages—expectoration of blood—from which he had suffered at times for sixteen years. His first hemorrhage had occurred when he was nineteen years of age, after a sharp run for a train. From this time until his visit to me he had recurrences of expectoration of blood at intervals, varying widely in length. He had never had a profuse hemorrhage. He had been sent to Colorado because of his hemorrhages, but with no benefit to his general health—as he gave no history of depressed health at any time during the sixteen years—nor to his hemorrhages. His history gave no evidence of tuberculosis, hematophilia, or troubles similar to that from which he was suffering, in other members of the family. He also had never had other hemorrhages or hemorrhoids, nor did he have enlarged veins of the leg. His general health had always been good. A careful general examination revealed nothing abnormal. He never had any rise in temperature while he was under observation—a period of eighteen months. An examination of his upper air-passages revealed nothing abnormal. An examination of his larynx re-

vealed nothing except a bleeding-point—a minute ruptured blood-vessel in the anterior third of the left vocal cord; I could watch the blood as it flowed down the cord and into the posterior part of the larynx. I kept him under observation for eighteen months, and saw him a number of times when suffering from hemorrhage. The hemorrhage always came from the vocal cords, and the bleeding-point could always be detected. At no time while under my observation, or at other times, as far as his history revealed, had he suffered from a submucous hemorrhage. This patient I treated with a spray of ferric alum. I never could decide if it had any special influence on the case, either in arresting the hemorrhage after it started, or in preventing a recurrence. The hemorrhage usually lasted from one to three days, and recurred after varying intervals. It did not seem to be connected in any special way with taking cold. The patient had never suffered from any throat trouble, outside of the time of hemorrhage. The patient was always anxious as to his condition, and, in spite of my assurance to the contrary, he could not be persuaded that these hemorrhages were of little importance. In the spring of 1897 he went to New Mexico. He went because of his own fears, and not upon my recommendation or that of his family physician. After being in New Mexico for six months he died from a profuse hemorrhage from his larynx. At no time during the six-months' stay in New Mexico had he suffered loss of flesh or strength, night-sweats, cough or expectoration, gastro-intestinal disturbances, or any other symptom of tuberculosis.

REMARKS ON CASE I.

Although no bleeding-point in this case could ever be discovered, there is no good reason to believe that this case was other than a laryngeal hemorrhage. The profuse hemorrhage from which he suffered in England and the very profuse hemorrhage from which he suffered two years before coming under observation, were undoubtedly due to a ruptured blood-vessel. The chances are that the slighter hemorrhages from which he had repeatedly suffered, were due to a diapedesis from the blood-vessels. The general engorgement of the blood-vessels of the mucous membrane of the larynx and adjoining parts of the throat, the prompt improvement of this engorgement under astringents, as well as the prompt disappearance of the hemorrhages from local treatment only, the reappearance of the hemorrhages after

using the voice in singing, all argue strongly in favor of the diagnosis. The absence of disease of the lungs also leaves little room for doubt as to the source of the hemorrhage.

REMARKS ON CASE II.

The detection of the bleeding-point on repeated occasions, leaves no doubt as to the diagnosis in this case. The history of the patient before coming under observation, the history after passing from observation, the evidence acquired during the eighteen months while under observation, all substantiate the diagnosis of uncomplicated hemorrhage from the larynx. The manner of death was unusual. Authorities state that there is no case on record of death from laryngeal hemorrhage. I see no other explanation possible in this case, yet I confess that it seems impossible that any one of the laryngeal vessels when ruptured should furnish blood sufficient to cause death. An expectoration of blood in any quantity has its source ordinarily from some part of the pulmonary tissues. It is easy enough to tell a patient that the blood comes from the throat, if upon examination of the chest no marked lesion is found. However, I am very certain that the source of hemorrhage is pulmonary, even in the absence of marked lesion. I remember distinctly a case of pulmonary hemorrhage in a boy aged 18 years, who presented himself to me within a few hours after the occurrence of a sharp expectoration of blood. His history for the last few weeks was negative. He had lost no flesh or strength to his knowledge, nor had he suffered from gastro-intestinal disturbances. His evening temperature was 98.5°, and his pulse 90. A careful auscultatory examination of his chest, revealed only transference of heart sounds at the left apex and a patch of subcrepitant râles. I kept the patient under observation for a number of months. During the next six weeks the physical signs at the left apex became more marked in spite of treatment and in spite of great improvement in his general condition, although upon coming under observation he was not conscious of feeling less vigorous than usual. The physical signs in this case were never marked. If, after the first examination of the chest and no marked lesion being discovered, the case had been considered a hemorrhage from the throat and the patient had been given general tonic treatment, or possibly no treatment at all, the case might have been considered as a hemorrhage from some portion of the upper air-passages, and not as having had its source

in the lungs. I surely have seen many such cases in the last twelve years. Whether the condition of the lungs responsible for such hemorrhage is necessarily tubercular need not enter into this discussion. I believe that if a patient having expectorated blood in any quantity is watched, and his chest carefully examined at intervals for a few weeks or months after the hemorrhage, time will prove the hemorrhage to have been pulmonary in origin in the great majority of cases, although at the occurrence of the bleeding nothing special in the chest may have been detected. A laryngoscopic examination in such a case is, of course, of great importance, although in the absence of a bleeding-point or a general engorgement of the blood-vessels of the lower throat, a physical examination of the chest is of no less importance.

Cases of laryngeal hemorrhage are rare. Authorities agree as to this point. That such cases do occur is surely certain. The hemorrhage may be free from the surface of the larynx from the rupture of a vessel as in one of the cases reported, or it may occur as an extravasation into the submucous tissues. The hemorrhage can also arise as a diapedesis from the blood-vessels. The term hemorrhagic laryngitis, under which this form of disease has been designated, until more recent observation, is not a fortunate one. This term presupposes that the hemorrhage occurs as a part of an inflammation of the larynx. This is not the case, necessarily, as the hemorrhages often occur while the patient has no inflammatory condition of the larynx. The disease may occur in patients of perfect health, and, as far as my observation goes, this has been the case. It is easy to understand how a hemorrhage of the larynx might arise in patients suffering from any organic disease of the heart or blood-vessels, the lungs or abdominal viscera. I confess, however, that I have never seen a case under such conditions. To decide the determining cause in cases like those reported is not easy. It seems to me that the explanation is only to be found in some abnormal condition of the blood-vessels. Whether this pathological condition of the laryngeal vessels may be produced by any disease of the air-passages above the larynx is a question that I think can be answered in the negative. There was no such explanation in the cases reported. The hypertrophic rhinitis was slight, and I attached little importance to its presence. If marked abnormal conditions of the air-passages above the larynx had ordinarily anything to do in the etiology of such cases, their occurrence would not be so rare. The patient probably possesses weakened laryngeal vessels with a tendency to rupture,

and consequent hemorrhage. This view seems as reasonable as that certain patients should have a tendency to repeated nasal, uterine, vesical, or hemorrhoidal hemorrhages.

DISCUSSION.

Dr. CHAS. W. RICHARDSON, Washington, D. C.: I have been very much interested in Dr. Straight's paper; very much interested because I had thought, last winter, of reporting a series of cases that sound almost like Dr. Straight's cases. I had not thought of reporting them as laryngeal or post-nasal hemorrhages so much as tubercular hemorrhages. These cases of Dr. Straight's have been interesting to me, also, because for periods of two or three years patients have been under my observation who have had copious hemorrhages from the larynx or pharynx, although examination would fail to show the exact site of the hemorrhage, and they were supposed to be laryngeal or post-nasal simply because there was no tubercular lesion demonstrable in their lungs, nor could the tubercle bacillus be discovered in the examination of the sputum. These cases have been followed carefully. The hemorrhage, at times, would range from two ounces to a quart. In one case I was hurriedly summoned; a carriage was sent for me to come at once and attend a hemorrhagic case. It was only about five-minutes' drive. When I arrived they were holding a basin to receive the blood. The patient was a man of two hundred pounds, a man of magnificent physique, and he had lost over a quart of blood. The flow had about ceased when I arrived. I kept him in bed for a few days. Examination at the time showed that the larynx and postnasal cavity were filled with blood. The discharge was very copious through his nose and pharynx. We could find no evidence of tubercular lesion in his lungs, and no bacilli in his sputum. Inasmuch as I have referred at such length to this case, I might as well end it. During the next two or three years he had several more hemorrhages almost as copious, and about a month ago had three hemorrhages in one night—was almost ensanguinated. For four days after this I saw him daily. Examination still failed to discover any source of the hemorrhage, but I was convinced that such an amount of blood could come from no source but the lungs. On the fifth day I found evidence of tuberculosis in the right apex. He is now running the course of the most typical case of rapid tuberculosis which I have ever seen. I fully expect him to be dead when I reach home. This is one of the cases of suspected laryngeal hemorrhage which was undoubtedly from the lungs. No tubercle bacillus had bee found in his sputum until the last week.

During the Christmas holidays I saw a gentleman, a brother of one of our distinguished colleagues, who had had hemorrhage of this same type. I telephoned his brother, told him of these hemorrhages, and that I was certain the patient was tuberculous. He said, no, very positively, that there was absolutely no tuber-

culosis. He told me that examinations had been repeatedly made, that there was positively no tuberculosis, and that the hemorrhages were from a local laryngeal source. I examined one of the clots and found tubercle bacilli, and in an examination of the lung found a slight infected area. I saw another case of the same type of hemorrhage about four years ago. He came to me the day after the first hemorrhage, and on examination I thought I could distinguish a lesion in his postnasal cavity. I was suspicious of tuberculosis, but I told him not to worry, that the hemorrhage probably came from the lesion referred to. I treated him for a few days, and then saw him no more for about six months. He then had another slight hemorrhage. I examined his chest and some of the blood-clots, but could find nothing. A short time afterward there was a copious hemorrhage. I kept him under treatment of the postnasal cavity for some time. He gained in flesh, his physical appearance improved in every respect, and he kept on improving. All at once he commenced to run down; examination at this time showed the presence of the tubercle bacilli in his sputum, and he is now in Asheville under treatment for tuberculosis. Therefore, I say, we must be very careful in asserting that a hemorrhage comes from the larynx or from the pharynx or the postnasal cavity, unless we can see sufficient in these regions to account for the amount of hemorrhage that takes place. We all know how frequently these hemorrhages do take place from the lungs in which we can find no evidence of tubercular lesion at all, until, finally, the tuberculosis is fully established.

Dr. S. E. Solly, Colorado Springs, Col.: This is a subject that is exceedingly interesting to me. Living in Colorado, such cases often come under my notice. Of course, we all know that cases of laryngeal hemorrhage do occur, and Dr. Straight's case may have been of this type; but in my experience they are very rare. As Dr. Richardson has said, when the hemorrhage is profuse it is generally from the lungs. I have never seen a case of laryngeal hemorrhage in which the hemorrhage was the cause of death, and I cannot but think that the case under discussion was one of pulmonary hemorrhage. We are very apt to think that a case of pulmonary tuberculosis must show absolute signs, although we know that this is not always the case. Pulmonary tuberculosis may occasionally exist for years without exhibiting any of the characteristic signs in the chest, and without bacilli being found in the sputum. Whether the X-rays will help us to discover these cases earlier or not I personally am not sure. We are all working upon this question in Colorado, success has already been expected by good authorities in other places.

I think in a case of hemorrhage where there is no discoverable source that we should examine the temperature carefully. A slight rise in temperature may prove a clue to the diagnosis. Of course, the rise would not be large, and might be due to the mental perturbation; but if we get a little rise in the afternoon

it certainly should be taken into consideration. Tuberculosis may be present, and yet remain limited and quiescent, and yet it does not give rise to advancing disease, that is, the disease will be limited and remain quiescent perhaps for years.

Dr. ROBERT LEVY, Denver, Col.: I would like to ask Dr. Straight if he made a careful search for aneurism in the latter case.

Dr. H. S. STRAIGHT, Cleveland, O.: A careful examination revealed no suspicion of aneurism.

Dr. HENRY L. WAGNER, San Francisco, Cal.: I am reminded by Dr. Levy of a case I have observed, some years ago, where post-mortem examination showed no tuberculosis. The patient had had several hemorrhages, which seemed to come from the trachea, and a careful examination was made for tuberculosis, but nothing could be found, neither any bacilli in the sputum. A careful examination showed a marked pulsation of one tonsil, and I referred him to one of my colleagues for physical examination, by whom the diagnosis: Aneurism of the aorta was given. The hemorrhage from the throat was quite profuse, and almost impossible to control. Some three or four months later the patient died, and the post-mortem verified the diagnosis.

Dr. PRICE BROWN, Toronto: About five years ago a man, aged sixty-four, came under my observation. He was an Englishman, one of your high-livers. He consulted me in regard to a hemorrhage from the throat. He weighed some two hundred pounds. I examined his pharynx and found it covered with little blood-vessels. He was a very plethoric person, and I thought the hemorrhage might, and probably did, come from this network of veins. I put him on a light diet and he lost about twenty pounds in flesh. I also cauterized several of the little blood-vessels in the back of the throat. That was five years ago. He kept his weight down to about one hundred and eighty to one hundred and ninety pounds. He has had several hemorrhages since. He is still alive, an active man, sixty-nine years of age. The short diet is still persisted in. I think the hemorrhage may be due, in plethoric persons, to hemorrhage through the thin walls of the exposed blood-vessels; especially is this the case with old men.

Dr. F. J. QUINLAN: I have been very much interested in the remarks of the various speakers. I think in all such cases of spitting of blood that particular attention should be paid to the lingual tonsil, as well as the base of the tongue. The hemorrhage is frequently associated with a varicose condition of the vessels. These hypertrophied tufts are frequently congested and filled with blood, and the blood-vessels may be very easily ruptured by coughing or any unusual exertion. It is well, therefore, to carefully scrutinize these parts. It is wise for us to be cautious in the removal of this redundant tissue, and not to cut too deeply, especially if the parts show marked vascularity.

I think one of the speakers has said that in arriving at a diagnosis the temperature should be taken into consideration. If

there is a tuberculous condition, there is almost certain to be a slight rise of temperature, and more or less acceleration of the pulse, though, perhaps, no bacilli may be found.

Dr. WENDELL C. PHILLIPS, New York: I did not have the pleasure of hearing all of the paper. It has been my experience that removal of the hypertrophied tissue at the base of the tongue has not usually been followed with great improvement to the singing or speaking voice, but much relief to the painful irritability of the throat may be expected.

Dr. MAX THORNER, Cincinnati: I do not think Dr. Straight is entirely wrong in the matter of too frequent operations upon hypertrophied tonsils, and that often the enlarged tonsil does no harm; but, on the other hand, I have seen very excellent results produced by the removal of the hypertrophied growth. I think in making our examinations that at times we do not make them sufficiently complete. The trouble is not always located in the pharynx nor in the laryngeal region, but on the base of the tongue. There are many conditions which do not need operations; cases of acute inflammation of the lateral region of the tongue and of the lingual tonsil. These affections are very painful, and the patient goes from one physician to another for relief; but, strange to say, the actual source is often overlooked. If you look into the mouth with a tongue-depressor, you cannot see the trouble. If you take a napkin and draw the tongue well forward and sideward, you will see these regions very distinctly, and will frequently discover inflamed spots on the side of the tongue as small as pin-heads. These may be treated, if acutely inflamed, by any of the astringents; nitrate of silver in from 5 to 10 per cent. solutions is often very beneficial. If the lingual tonsil is very much enlarged, however, as the result of chronic inflammation, or if the papillæ on the side of the tongue are greatly hypertrophied, and are a constant source of irritation, nothing will give better results than their removal by either clipping them off, or destroying them with the galvano-cautery.

Dr. DWIGHT L. HUBBARD, New York City, N. Y.: It seems to me, in a study of this kind, we should not entirely overlook the several constitutional conditions which exist, such as a rheumatic diathesis, uric acid, etc., etc. There is another point also, which should not be overlooked. Patients with enlarged lingual glands will always have a throaty condition of the voice, and I think this is sometimes caused by not using the voice properly, not calling into use the air-chambers above. The volume of air is not carried upward or forward with sufficient effort, and the voice lacks resonance. In these cases it is our duty to remedy any pathological condition of the pharynx, to treat these disturbances, and also to teach the patient how to use the voice properly in order to produce a proper head or nasal resonance. By little instruction in this latter particular you will find your patients will gain in range in the upper and lower registers with a decided clearing up of the throaty quality.

PAPER:

PERICHONDRITIS OF THE LARYNX; WITH A REPORT OF TWO CASES, AND THE DESCRIPTION OF A NEW TRACHEOTOMY-TUBE.

BY GEORGE L. RICHARDS, M.D.

As a primary affection perichondritis of the larynx is rare, due when it occurs, to cold or exposure, or a complication in connection with some one of the infective fevers; rarely to traumatism, as in the case of a foreign body in the larynx. Secondarily it occurs in connection with tuberculosis, carcinoma, or syphilis, especially the latter two. Here it may be and frequently is very difficult to make a positive diagnosis. In any case the disease is essentially a destructive one, usually going on to necrosis and pus-formation. Recovery, when it takes place, is due to a cessation of the process, with resultant ankylosis of the joints that may have been involved, or else, in those rare cases in which the inflammation has not gone on to pus-formation, the affected cartilage becomes wholly or partially ossified.

The symptoms, which are invariably grave, are so in consequence of the relation of involved cartilages to important laryngeal structures, and the impossibility of having any severe inflammation there, whether of soft parts or cartilages, without serious interference with both phonation and breathing. With the formation of pus and the danger of its discharge into the larynx, such interference becomes grave, as one, at least, of my cases will show. Moreover, before the case goes on to pus-formation life may be threatened by the severity of the dyspneic symptoms, and if tracheotomy be not performed, death results; hence the need of making a diagnosis at the earliest possible moment. One cartilage may be affected to the exclusion of all others, though that is unlikely, as by contact other cartilages are liable to be involved. In the order of probability, perichondritis affects the arytenoid and cricoid cartilages most often, less frequently the thyroid cartilage and the epiglottis. An early diagnosis may be difficult, owing to the readiness with which intralaryngeal and extralaryngeal structures become swollen, thereby preventing satisfactory examination. Especially is this the case when the epiglottis and the false bands, one or both, are considerably swollen. Under such con-

ditions the symptoms of edema of the glottis may entirely obscure the primary affection. Given a diagnosis, the probabilities are in favor of necrosis and pus-formation. The thyroid and cricoid may be affected on either their inner or outer surfaces, while the arytenoid will be affected throughout its whole extent. The arytenoid, when swollen, has a pear-shaped appearance; and the pus, when present, will point at or near the vocal process. The affected cartilages early become immovable and the vocal band of that side fixed, assuming the cadaveric position, and in phonation requiring its fellow of the opposite side to approximate as closely to it as possible. The color of the parts is heightened in intensity, while the aryepiglottic folds lose their pearly luster. The epiglottis is likely to be swollen irregularly, if only one side is affected, owing to the line of division between its two halves. The pus has a foul odor, which is especially marked in cases of syphilis. The laryngoscopic image is one of infiltration of the affected and adjacent structures. Externally there is little that is characteristic, as there is no appreciable swelling unless the external surface of the cartilage is involved and then it is not very great.

If the pus discharges on the outside, the danger is much lessened, as a fistulous opening is likely to be made first. With that as a guide the pus can be satisfactorily evacuated, unless the destruction has been too great. When the abscess tends to point inwardly, as it will usually do if the intralaryngeal surfaces of the cartilage are principally involved, the risks of suffocation, both before, during, and after evacuation, are greatly increased. Under such conditions the abscess should be opened at the earliest possible moment and the pus evacuated.

If the pus cannot be evacuated, or if the presence is not recognized in time, the further history will depend entirely on the symptoms. Tracheotomy should be performed as soon as symptoms threatening life appear, and should not be left as a last resort, when discharge of pus has begun and the patient is weakened, with resulting inability to properly expel it by coughing, and the development of septic pneumonia if it be not expelled.

Early diagnostic signs of the primary variety are hoarseness, difficulty in swallowing, difficulty in breathing, and pain. Pain is a variable symptom and depends on the amount of pressure on affected areas brought about by the inflammation. It will be greatest when the arytenoids and the cricoid are affected.

When the disease is secondary to syphilis, carcinoma, or tuber-

culosis, the diagnosis depends upon a differentiation among these diseases, and is a perichondritis only because it is the cartilage that is involved. The diagnosis between syphilis and carcinoma in doubtful cases is often a most difficult one, as in the case to be reported. As carcinoma is primarily a disease of the soft parts, attacking those in the larynx by preference, the chances of the case being syphilitic are greater when the cartilage is the part involved, especially if a syphilitic history can be obtained.

In a slowly progressing case of perichondritis the diagnosis must necessarily rest between syphilis, carcinoma, and tuberculosis. The diagnostic signs of the latter are sufficiently clear, so that it ought not to cause much trouble. In the absence of, or even with, a syphilitic history it may be impossible to decide as to carcinoma, or tubercle, for a syphilitic may suffer from carcinoma or tuberculosis as well as any one else. Many of the symptoms are common to both. The destructive process can be as fatal in cases of syphilis as in those of carcinoma. As to the treatment of this form of perichondritis a few words will suffice. Both carcinomatous and syphilitic perichondritis are always grave. Tracheotomy is to be performed whenever the necessity arises. Laryngotomy, or laryngo-tracheotomy, or any serious intro- or extralaryngeal operation is hardly to be considered, if there is any extensive perichondrial inflammation. If the case is carcinomatous, it necessarily progresses more or less rapidly to a fatal termination; while, if it is syphilitic, antisyphilitic treatment may hold the process in check, the necrosed tissue may be cast off, or encapsulated, and the individual may live for some time, breathing, if need be, through a tracheotomy-tube or a tracheal opening. In all these cases tracheotomy should be performed as low down as possible.

The vocal bands and their power of phonation will be affected in accordance with the cartilage involved, and as one or both sides suffer. When the cricoid is involved on its posterior aspect, or one or both arytenoids, the difficulty in swallowing may be very great. Difficulty in swallowing will also occur in connection with the swelling, and, it may be, edema of the epiglottis, which is invariably present and prevents the proper closure of the glottis. When this is extreme, the taking of food becomes so uncomfortable that, even when the swallowing is of itself not so painful as an act, the getting of some particles of food into the windpipe causes such coughing and distress that food will be refused for this reason, if for no other.

The following two cases illustrate the points that I have referred to:

Case I.—J. M., male, 60 years old, born in England, formerly a cotton-mill operative, was seen in May, 1897, when he was suffering from an attack of severe dyspnea, almost strangulation. Examination showed a much swollen and edematous epiglottis, with its two halves folded on themselves, omega-shaped, and in contact. The vocal bands were not visible. The aryepiglottic folds were swollen. The right arytenoid was altered in shape and appearance. In the right pyriform sinus was seen ulceration and gray deposit, bleeding easily. The whole picture suggested carcinoma, though there was no pain, and not much difficulty in swallowing.

The epiglottis was freely incised and the dyspnea much relieved. The breathing improved, and later, I was able to make a satisfactory examination and found the folowing: The right half of the epiglottis was swollen and thickened; the right aryepiglottic fold infiltrated and swollen so as to give a tumor-like appearance to the part; the right arytenoid had lost its individuality, was enlarged, thickened, irregularly swollen, and immovable; the right vocal band was invisible beneath the foregoing structures. On the left side the epiglottis was free from swelling; the arytenoid was movable, and only a little larger than normal; the vocal band was very red and somewhat thickened. Phonation was effected apparently by efforts of the left band only; voice, hoarse, though not markedly so. In the right pyriform sinus was an ulcerated area admitting a cotton-tipped probe from ½ to ¾ of an inch, and covered on its withdrawal with blood and granulations. Pure lactic acid was applied, but neither examination nor application seemed to produce any pain.

The previous history was not very clear, although he had apparently had throat-trouble for some time; and once before, and perhaps twice, had had an attack of difficulty in breathing, though nothing like the attack in which I first saw him.

The diagnosis seemed to lie between tuberculosis, syphilis, and carcinoma as a cause for the perichondritis of the left arytenoid and adjacent cartilages, which was evidently the lesion with which I had to do. Tuberculosis was easily ruled out on account of the entire absence of any suggestive constitutional symptoms. Later, I obtained a history of a primary sore in 1863, when the patient was in the army, and which had been treated for but a short time by an army-surgeon. As he had raised a family of five children since then, four of whom were apparently perfectly healthy, and the fifth

not far from that condition, and as 34 years had elapsed without there having been, so far as he knew, anything in his history to suggest a return of the disease, I was in doubt as to how much to ascribe to this source. In the absence of any pain or cachexia suggestive of carcinoma, I assumed the diagnosis to be tertiary syphilis, and began to treat him accordingly. He was given potassium iodide and mercurous iodide internally and iodo-glycerine locally. The first was rapidly increased up to 20 gr., thrice daily, which seemed to be at that time about the limit of tolerance. He improved rapidly, and about July 1st the right arytenoid had the appearance of an enlarged, thickened, hard cartilage. In the middle of July there was another acute attack of dyspnea, though not severe. I removed, then, two small bits from the aryepiglottic fold, unfortunately too small for microscopic examination. Bleeding and relief followed. For a month he did well, except that the antisyphilitic treatment was omitted once or twice because it seemed to upset the stomach. This may have been due to the mixed treatment that was employed in the hope of getting a still greater alterative effect, for when that was later omitted, he took large doses of potassium iodide. Monochlorparaphenol in ten per cent. strength was being applied locally to the ulcerated area, and under its use healing apparently took place. During my absence in August another acute attack came on, and the ulceration broke out afresh, the whole appearance becoming more suggestive of carcinoma than at any previous time. He was, however, free from pain and carcinomatous cachexia. Early in September I began to apply, after twenty per cent. cocaine, pure liquid formaldehyde to the sinus-ulcerations. This caused sharp pain for a few minutes, but was followed by relief. The patient now began to complain of poor nights, and coughed and raised bloody matter. On September 15th, while making an application to the left sinus, the applicator went down an inch below the surface bringing back a clot and considerable foul-smelling blood; and for the next few days considerable blood was spit up. Following this I was several times called to his house on account of bleeding from this region, which was always easily controlled by tannic acid and ice. Externally there now appeared a cartilaginous enlargement of the right wing of the thyroid, irregular in outline and not painful on pressure. On September 23d, he had an attack of severe dyspnea, and I thought I should have to perform tracheotomy, but he became easier. The trouble still seemed limited to the cartilaginous structures of the right

half of the larynx. These structures were pushed over to the left side in such a way as to cause dyspnea. Soon after this the patient was seen in New York by Dr. Robt. C. Myles, who at first thought the trouble was carcinoma, but who, after a long and careful examination, came to the conclusion that it was probably syphilitic perichondritis of the thyroid, including the arytenoid, and all the adjacent folds, affecting mostly the right side. It was thought it might be carcinoma, but inoperable in any event, owing to its relation with the esophagus and the pharynx and the impossibility of removing everything without great damage to these. Treatment in a hospital, and large doses of potassium iodide up to 180 gr. a day, were advised. It was thought tracheotomy would have to be performed in a few days on account of the dyspnea. He was admitted to the Fall River Hospital and put on 30 gr. of potassium iodide thrice daily, to be increased 5 gr. daily. In a day or so the temperature began to rise, and the pulse to become accelerated, while the dyspnea increased and he became cyanosed to such a degree that at midnight of September 23d, I was hurriedly summoned, and found him nearly cyanotic and at once performed tracheotomy between the second and fourth rings. He did well for a day or two, and then developed well-marked pneumonia, and an unfavorable prognosis was given. Not wishing him to die in the hospital, he was removed to his home in the ambulance. On the way, but unknown to any one at the time, the tracheotomy-tube, which was evidently too small, though the largest we had, slipped out and a great deal of mucus was coughed up. When I saw the patient a few hours later, I made no attempt to put back the silver tube but substituted for it a piece of hard-rubber tubing slightly ellipsoid in shape and of greater caliber. This was carried through the tracheal opening and fastened by a string passing through a hole in the tube-wall. Subsequently the opening in the trachea was enlarged and some form of hard-rubber tube worn until a permanent silver one, formed on the same lines, was made. The hard-rubber tube was often coughed out, but was easily replaced.

The pneumonia ran its usual course, with moderate fever. On October 5th I began the administration of potassium iodide again, and by October 18th he was taking 180 gr. every other day, and with the tube closed, could talk some and breathe a little. There was no bleeding from the larynx, and things seemed *in statu quo.* The patient was soon up and about the house, was gaining in flesh and strength and could swallow liquid food without

pain. There was more or less troublesome regurgitation, owing to the food getting into the larynx, necessitating its ejection by cough through the tube. This was sometimes exceedingly troublesome, and at others not so on account, it seemed to me, of his inability to make the epiglottis work properly and close the glottic opening. The amount of mucus spit up and coughed up through the tube was very great. On election-day in November he was able to walk to the polls and vote. About this time there appeared rapid involvement of the left arytenoid and the esophageal surface of the interarytenoid space; while so far as surface-manifestations appeared, the ulceration in the right sinus had seemingly healed. The patient now began to complain more of difficulty in swallowing than at any previous time, and the breathing became extremely difficult when the tube was closed. The ulceration broke out again and the bleeding became very troublesome. He was taking 180 gr. of potassium iodide every other day, and was up and about all the time. The left side began to be more and more involved, and I changed my diagnosis to carcinoma and increased the potassium iodide to 140 gr. every day, hoping still that the disease might be syphilis and that I should be able to control it. There was no improvement: the epiglottis became very edematous and had to be repeatedly incised; the ulceration became active again, swallowing difficult and painful until both food and medicine were refused. Necrosis of the thyroid cartilage took place, with discharge of pus between the two layers of the deeper fascia of the neck opening into the tracheotomy-opening. He failed rapidly and finally died on January 22, 1898, nearly five months after the tracheotomy had been performed.

At the autopsy, held six hours after death, the soft tissues on the right side of the neck were all necrotic to the tracheotomy-opening. The larynx and trachea only were examined. The epiglottis was softened and much thickened; the surface-edema had disappeared. The right half of the thyroid was stripped of its mucous membrane, the super or horn and adjacent tissue mostly gone, and what was left was soft and necrotic. There was a spontaneous fracture begining near the attachment of the upper horn to its fellow of the opposite side, and going downward and backward nearly to the inferior horn; and the line of fracture was necrosed. The right arytenoid was the size of an almond, irregular in shape, on its surface finely nodular, and somewhat warty in appearance. The right aryepiglottic fold was mostly obliterated by enlargement of the arytenoid and the epiglottis. The left ary-

tenoid was half as large as the right, though of about the same gross appearance. The vocal bands were thick. The right band in its anterior half was not especially changed, but posteriorly it was in part destroyed, soft, and in part partaking of the nature of the surrounding diseased structures. The left band was smooth at its border throughout its whole length. In the region of the vocal process there was a funnel-shaped opening, leading down to the cricoid, the covering of which at this point was denuded. The cricoid cartilage, as a cartilage, was unaffected, but, beginning at the bases of the arytenoids and the interarytenoid space, the soft parts covering the posterior surface of the cricoid and forming the beginning of the anterior wall of the esophagus to a point ¼ of an inch below the lower border of the cricoid, were thickened and enlarged to such a degree as to nearly obliterate the esophagus, while the surface of the cricoid had the same characteristics to a less marked degree as the two arytenoids. The left half of the thyroid cartilage was apparently normal. The diseased parts everywhere were soft and foul from the extensive necrosis and pus-formation.

From these appearances the weight of evidence was in favor of carcinoma as a diagnosis, although the cartilages rather than the soft parts seemed to have been primarily affected. The amount of involvement of the left arytenoid and the esophagus in the disease was much greater than I had anticipated, although the difficulty in swallowing had progressed very rapidly for the weeks immediately preceding death.

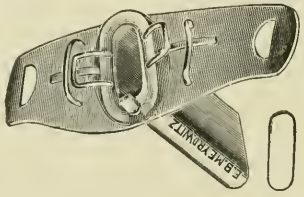
On microscopic examination of a section from the left arytenoid numerous nests of round epithelial cells, somewhat cylindrical on the periphery, were found; while the connective-tissue stroma was infiltrated in many places with round-cells. The mucous borders were thickened, and here the appearances suggested those of epithelioma of the lip. A diagnosis was made of epidermoid carcinoma.

Whether the presence of the old syphilis in any way affected the course of affairs I do not know. The histologic appearances of tertiary syphilis are not sufficiently distinct to enable us always to make a diagnosis from the microscopic findings alone.

One of the points suggested by this case is with reference to the diagnostic value of potassium iodide. That the patient improved under its use, and that the symptoms were less prominent is undoubted. He improved to such a degree that for a time I abandoned the diagnosis of carcinoma.

Is such improvement in a doubtful cases any proof of syphilis? I am personally inclined to believe that it is not. Furthermore, it is entirely within the bounds of a reasonable hypothesis to assume that even in malignant cases the well-known alterative action of the iodide may for a time retard the progress of the growth, even to the extent of causing us to believe that improvement is taking place.

As to operative measures, which are coming more and more into vogue in cases of serious laryngeal trouble, there was no time while the man was under my observation that a radical laryngeal operation would have offered any hope of recovery. I have been sorry since that I did not try mercury by inunction at the time that I regarded the trouble as syphilitic. Iodide has been regarded as the sheet-anchor in tertiary syphilis; so I stuck to it, giving, however, for two or more months at the beginning, mercurous iodide. In another suspected case of tertiary syphilis



of the nose or throat I should most certainly also give mercury by inunction.

The tracheotomy-tube here used is, I think, original with me, for I have never seen or read any description of one like it. It was made of silver, by a local jeweler, after a model that I had prepared, and was more comfortable than the regulation-tube. When a tube must be worn for some time this one seems to me to possess some advantages. It furnishes an abundant supply of air; the patient can talk by placing a finger over the tube, and he can have, for prolonged conversation, a little plug that can fit inside, or a little door could be made to cover the opening. Having one edge longer than the other, it conforms itself better to the direction of the trachea; especially is this so if a low tracheotomy is performed. It should be long enough to pass into the trachea a short distance, but not far, and if made in advance of its possible use, it should be long enough, as it can be easily cut off, but cannot be lengthened. An instrument-maker could easily improve on this model.

Case II.—P. M., an Irish laborer, fifty years old, and probably alcoholic, though the previous history could not be obtained, was seen on June 1st and 2d by one of the district city-physicians, who found him delirious and breathing with difficulty, and complaining of choking, but not of pain. He was sent to the hospital with a diagnosis of edema of the larynx. When seen by me on June 6th the epiglottis was swollen and thickened, the left arytenoid enlarged and presenting a tumor-like appearance, as was also the aryepiglottic fold on that side. The right arytenoid was slightly enlarged, the vocal bands were not visible; and a grayish deposit and abundant mucus covered the parts. The voice was husky, respiration hurried and stridulous. Potassium iodide was given, although there was no evidence of syphilis, and in the absence of that, the case looked like one of primary perichondritis of the left arytenoid. On June 9th, he was somewhat cyanotic and more positively delirious, with slight elevation of temperature. The appearance of the larynx had changed but little, except that there were small punctate spots, like little pustules, here and there visible, especially in the left half. The epiglottis was more swollen, and dyspnea was more extreme. I scarified the epiglottis, and a few hours later the left arytenoid as well. Some temporary relief followed and the temperature dropped to normal. At 10 P.M. on June 10th low tracheotomy was performed by Dr. Buck and myself. He breathed better at once, but soon septic pneumonia developed. The temperature became high, and pulse and respiration accelerated, and death took place on the third day after the tracheotomy, the temperature being 103° and the respiration 44. The larynx was obtained for examination, but the chest was not investigated. The larynx was covered on its surface with foul-smelling pus, as were the surfaces of the trachea also. The edema had left the epiglottis at the time of the last examination; the left arytenoid and the aryepiglottic fold seemed to be merged, as it were, into one another at their junction. At this point there was a large pear-shaped swelling containing pus and discharging at about the vocal process. At this point, the cartilage was denuded of its covering. On the upper border of the left wing of the thyroid was a pus-cavity opening both externally and internally; the pus-cavity had been on the internal surface, for this surface was denuded downward for an area of half an inch. There was no direct connection between this and the arytenoid abscess. The false vocal band and all the tissues adjacent to the left aryepiglottic fold were infiltrated and edematous.

The true vocal bands and the right side of the larynx did not seem to be involved. Microscopic section showed an invasion of the cartilage by small round cells; unquestionably acute suppuration with destruction of the arytenoid and top of the thyroid.

The pus from these two abscesses caused the septic pneumonia. Being weakened by his ten days of previous illness, he had not the strength to cough up the pus. From the little that could be learned of the man's habits and previous history I regard the case as one of primary perichondritis, due probably to exposure, although I cannot positively exclude syphilis.

Had I been able to make a positive diagnosis of the presence of pus and had freely incised the arytenoid, the man might perhaps have been able to cough the pus up sufficiently to have recovered. As, however, he was in a semi-delirious condition, and laryngoscopic examination was exceedingly difficult, I may, perhaps, be pardoned for not recognizing the purulent nature of the perichondritis in time to save the patient. With a much swollen epiglottis, it is difficult to say with absolute certainty exactly what the condition of the underlying structure is.

My experience with perichondritis is limited, but I should regard well-marked cases of it affecting the internal laryngeal surface decidedly unfavorable as to prognosis. Recovery can, of course, take place when the abscess points inward, but it is unlikely. When the abscess points outward the case is entirely different, and if an early incision is made and the pus is properly evacuated such cases should recover. In cases due to syphilis, which are recognized early and treated appropriately, recovery is entirely possible.

PAPER:

RHINOLITH.

BY J. F. HILL, M.D.

WEIGHT 275 GRAINS.

May 31, 1897, Mrs. R., aged sixty years, consulted me for nasal catarrh. She gave the following history:

For nearly twenty-five years had been afflicted with a profuse offensive discharge from the anterior and posterior nares. During that period she had consulted several physicians, who had prescribed washes and given her the comforting assurance that there was no cure, as the disease was due entirely to the climate. Of late years she had noticed a gradual loss of hearing in the right ear, tinnitus aurium, epiphora of right eye, and epistaxis; and severe headaches had become of daily occurrence. She had not been able to lie upon her right side for five years without increasing the headaches and tinnitus.

Examination showed that the external nose (right side) presented a distinct deflection of the dorsum. The right nasal passage was impervious to air and was filled up with a thick mucopurulent discharge and granulations. There was a marked deflection of septum in left nostril toward that side.

After thoroughly syringing both cavities with an alkaline solution, I passed a pledget of cotton saturated with an eight per cent. solution of cocaine into the right nares, for the purpose of reducing the swelling of the mucous membrane and producing local anesthesia. By posterior rhinoscopy the mass could be distinctly seen as a grayish substance nearly filling the posterior nares. The outline of the turbinated bodies could hardly be made out. Again directing my attention to the anterior nares, I removed the pledget of cotton, and curetting away some granulations, came upon a hard and roughened substance, about three-quarters of an inch from the tip of the nose, and completely filling the anterior nares. With a hook, I endeavored to dislodge it, but found it immovable.

Upon questioning her, she stated that she had no recollection of ever having put anything into the nose. Having satisfied myself, however, that I had to deal with a rhinolith, I advised

its immediate removal. She readily consented, and the following morning, with the assistance of my colleague, Dr. Thayer, the patient being thoroughly etherized, I removed the mass by crushing with an ordinary lithotrite, designed for crushing urinary calculi.

It was impossible to determine either its exact size or weight, as in using the lithotrite to break up the mass, undoubtedly many of the smaller pieces were lost in the copious hemorrhage which attended the operation. The weight of that which I was able to save, and which I submit for your inspection, weighed 275 grains.

The inferior and middle turbinated bones were much wasted and ulcerated. After cleansing the nostrils, I curetted the surfaces of the inferior and middle turbinated bodies, and syringing with a 1 to 5000 solution of bichlorid, followed by sterilized water, packed the nostril with plain gauze. This pack was allowed to remain in forty-eight hours, when it was gently removed; again syringed out as before, and repacked, though less firmly.

On the fifth day the pack was omitted, but a strip of gauze was passed into the nostril in order to keep the surfaces apart and prevent adhesions. At the end of two weeks the gauze was entirely dispensed with, but the nostrils were cleansed three or four times a day for a month.

I discharged the case July 7th, about five weeks after the operation. At this time there was no perceptible deflection of the dorsum, and she claimed that all the disturbances which she had suffered had passed away. She can lie upon either side with perfect comfort. There is no epiphora nor tinnitus. The hearing is nearly as good in the right as in the left ear, and headaches are a thing of the past.

DISCUSSION.

Dr. JOHN O. ROE, Rochester, N. Y.: Several years ago I published a case in which I removed a rhinolith, weighing about three drachms. The patient, a young lady, about 18 years of age, had had a fetid discharge from the right nostril for about six years. On exploring the nose for the cause of this discharge, I found it completely obstructed by what appeared to be a movable body. On dilating the nostril and passing a slender curved instrument behind this substance, I succeeded in removing it unbroken. It occupied the central portion of the nostril about one inch from

the anterior meatus. On examination it was found to be composed largely of phosphate of lime.

An interesting point in regard to this rhinolith was that a section through the center showed that the nucleus was a pledget of cotton which doubtless had been introduced into the nostril several years before.

Dr. Dwight L. Hubbard: Dr. Roe's case reminds me of one of a school-teacher who came to me suffering from nasal stenosis. An examination revealed the presence of a rhinolith about one-half inch wide and two lines thick. I removed it without difficulty. The nucleus was a pledget of cotton which had been placed there some five years previous by a physician with whom she had been treating for some catarrhal difficulty and never removed.

Dr. Price Brown, Toronto: I had a case some years ago from which I removed an exceedingly large rhinolith. Eighteen years previously, the patient had received a severe blow on the nose, fracturing the nasal process of the left superior maxillary bone. Ever after she had nasal trouble. On examination, I found a rhinolith which was so large that it was impossible to remove it entire. It had to be broken up into fragments. I imagined the rhinolith to be formed around a small piece of bone left in the cavity after the original fracture, but upon a careful examination I found that the nucleus was a little round button.

Dr. L. C. Cline, Indianapolis, Ind.: I had a case of rhinolith in a boy some eight years of age, who was referred to me for some catarrhal trouble. On examination, I found a rhinolith, perhaps three quarters of an inch in length, a little over one-half inch wide, and probably about three lines in thickness. I removed it with a pair of forceps, and in the rhinolith I found a piece of rubber tube that I supposed to be the nucleus. One other case I operated on was on a young man about nineteen years of age. The rhinolith was over three-quarters of an inch in length and so large that I had to break it up in pieces with a stout pair of forceps before I could remove it.

PAPER:

DYSPHONIA—RELIEF WITH THE USE OF THE GALVANIC CURRENT.

BY T. C. CHRISTY, M.D.

Dysphonia is the result of any interference with normal respiration and phonation, and may be accompanied by either pain, or cough, or both.

Dysphonia is

(*a*) Due to any interference with physiological functions of the glottis and true cords, generally from acute inflammatory causes.

(*b*) Not always in direct relationship with the intensity of the inflammation.

(*c*) Not always present in inflammatory affections.

(*d*) Not always associated with the constitutional diseases; presence of growths, etc.

(*e*) Found occasionally with that rare constitutional condition (mentioned by Morell Mackenzie), a chronic inflammation of the mucous canals.

(*f*) In cases of trachoma of the true cords known as singer's nodes.

(*g*) In cases of lithemic throat, also in gouty and rheumatic conditions.

(*h*) In cases of innervation of the larynx from general debility or localized paresis.

(*i*) Frequently present during the period of pregnancy.

(*j*) Causal relations not always determined by local inspection of the parts.

(*k*) One vocal cord only may be normal; its companion useless.

(*l*) Pain may or may not be a symptomatic feature.

(*m*) Mild forms of dysphonia occasionally due to gastic conditions.

(*n*) Stenosis of larynx; pathological changes found in subglottic space; chronic tobacco and alcoholic throats.

(*o*) Caused by an elongated uvula.

The diagnosis of the seat of the lesion by artificial aid, depends largely on the ability of the observer to keep in mind the color

of the normal mucous surfaces of the upper respiratory-tract available for purposes of examination, as the mucous membrane of the larynx differs from that of adjoining parts.

The mucous membrane covering the epiglottis presents the normal color of the larynx, "blassroth," and in anemia of the larynx is the distinguishing feature of that condition; for it then is perfectly pale, "ganzweiss." The mucous membrane of the aryepiglottic fold shows the normal appearance of the membrane of the mouth, the arytenoids and the interarytenoid space.

The true cords have a pearly-white color, a sharp contrast to the light red of the adjacent mucous membrane, owing, of course, to the character of their histological elements, being firm and tendinous with a diminished number of mucous glands. However, in voice-users, the color of the true cords is heightened to a moderate degree of congestion, which is constant. The congestion is not pathological, and the cords are healthy so long as they retain their firmness and power of contractility.

The normal glottis during quiet breathing is open wide, the group of muscles preserving the proper counterbalance or equilibrium so that ingress and egress of air is unrestrained. In deep and prolonged inspiration the glottis becomes still wider through the action of the posterior crico-arytenoid muscle, the transversus muscle is relaxed, the arytenoids are widely drawn apart, and the mucous membrane covering the inter-arytenoid space is uniformly smooth. During expiration the glottis becomes narrower, and when dyspnea is present, or momentarily preceding a violent effort, the glottis is tightly closed in order to increase the expulsive power of the air as well as to enable the inner recesses of the lungs to be filled by the deep inspiratory efforts.

Particular attention is to be directed to the examination of the interarytenoid space, the glottis and the immediate subglottic space; these points are usually involved in the severer forms of laryngitis—though the true cords may be exceptionally attacked without involvement of the arytenoids or the space lying below.

Generally more or less edema of the arytenoids and roughened appearance of the interarytenoid space is too plainly evident; also some swelling of the posterior inner wall of larynx, more frequently met with in children and young people, less in elderly persons.

The study of the subglottic space demands more than a passing notice, and for these reasons:

(*a*) It is the narrowest part of the laryngeal tract.

(*b*) The affections which attack this region have a tendency to cause stenosis.

(*c*) Pathological changes so alter the relative proportions of the subglottic space as to modify the resonance of the voice, and interfere with phonation and respiration.

The subglottic space lies between the vocal cords and the lower border of the cricoid cartilage, the cricoid ring forming the smallest diameter of the trachea.

The lining mucous membrane is loosely attached to the underlying structures by a very loose cellular tissue, and is abundantly provided with acinous glands. Inflammation of this space excites an excessive secretion of a thick, tenacious mucus, very difficult to expectorate, and which quickly becomes dry and adheres to the mucous membrane; thus interfering with the physiological action of the parts, acting as a foreign body in the subglottic space, an excitant of glottic spasm and the accompanying distress and discomfort.

The subglottic space is more vascular than any other portion of the larynx, the supply coming from the superior thyroid artery, which perforates the cricothyroid membrane.

It is also believed that the inferior surface of the true cords is more exquisitely sensitive than their superior surfaces; hence the pain so frequently experienced under inflammatory conditions.

Laryngeal catarrh of varying degrees of intensity locates in the subglottic space; syphilitic and tubercular poisons, and growths spring from this region, all tending to produce stenosis.

It is not a rare occurrence to find normal movable cords in a patient with a rough dysphonic voice, indications pointing to a subglottic disturbance.

Occasionally the loss of accommodative power in paresis of the thyro-arytenoids precedes the stage of congestion.

The question of the proper treatment of the pathological conditions springing from the subglottic space is important, as it implies intralaryngeal instrumentation which unavoidably excites pain, cough, and glottic spasm.

The two characteristic symptoms which mark inflamed conditions of this portion of the respiratory tract from other areas are: (*a*) hoarseness, or aphonia, or both (*i. e.*, "stimm-storung"), by intact true vocal cords; or (*b*) a peculiar cough; the laryngo-

scope is unnecessary to determine the seat of the trouble from these two symptoms alone. [Stoerk.] The cough arising from inflammation of the interarytenoid space is short and frequent, differing from that excited by similar causes in the larynx or trachea.

It is painful to hear and witness the almost intermittent cough which is ("stossend") not broken by deep inspiration, but caused by the continuous forcing of the air through the narrowed space of the cartilaginous glottis, causing a tickling irritability which the patient is unable to resist.

The cough is further symptomatic in that it is never accompanied by a secretion; sometimes, only little masses or lumps are forced from the ventricles of Morgagni, but a profuse secretion never appears.

When the inflammation results in edema of this interarytenoid space, the more chronic affections may possibly prove the exciting cause. Tubercle, syphilis, alcohol, and tobacco, or possibly paresis of one or more groups of the laryngeal muscles.

There are cases in which the point of irritation is referred to the trachea, where traces of catarrhal inflammation are to be found in those favorable for inspection by ordinary methods. In such instances, the mucous membrane of the trachea, instead of presenting the normal appearance of a pale, red, yellowish tinge, is deeply injected and slightly swollen even at the level of the larynx. [Stoerk.] The lining mucous surface of the trachea, continuous with that of the larynx, is more intimately associated with the underlying structures, and is adherent to the inner surface of the rings of the trachea; consequently, during an acute inflammation, the lining mucous membrane may furnish a high degree of inflammation without much apparent swelling.

In normal conditions the mucous membrane covering the tracheal rings is perfectly smooth and presents a clear white ("hellweis") color—while that protecting the interspaces has a deeper shade. In acute tracheitis the lining has a deep-red tinge with an uneven surface, owing to the swollen mucous glands.

Hoarseness, aphonia, and cough being present in acute inflammatory affections of the lungs, the tracheal mucous surface has an almost bluish-red (blauliche-rothe) appearance in comparison with the bright-red injection of the surface in tracheitis. Anomalies of the circulatory system, *i. e.*, cardiac hypertrophy, aneurism, valvular deficiencies, especially of the tricuspid valves, cause an

increased injection of the mucous surface of the larynx and trachea.

The extreme degree of anemia of the larynx and trachea in tubercular or other infiltrations of the lung affords a striking contrast to the conditions previously noted.

Subjective symptoms are few and are referred to larynx and trachea—described as a feeling of weight or pressure—especially over the episternal notch.

The feeling of pain and distress over this point is a constant symptom radiating over the central portion of the sternum and often to one or both sides.

Cough is more constant and noticeable than in laryngitis, and is excited by the inspiration of dust, hot, cold, or moist air.

The voice may be quite clear in the morning, the after-part of the day it grows husky, the patient speaks, if at all, with increased difficulty, or becomes aphonic.

At the episternal notch the trachea is about 1⅛ inch from the surface, but as the esophagus separates it from the vertebral column it is hardly supposable that the discomfort is caused by pressure from any cause.

Treatment is sought for the relief of the dysphonia, cough, and pain. The voice-change varies from the light, feathery huskiness, the hoarse, raucous tone, to complete aphonia: with a sense of constriction, dryness of parts, a constantly tickling irritability, light dyspnea, with occasional attacks of glottic spasm. Pain is referred either to larynx and glands, or the episternal notch in tracheitis.

The cough-centers are: (*a*) the interarytenoid space, (*b*) the posterior wall of larynx, (*c*) the spur of the bifurcation of the trachea.

In the graver forms of syphilis of the larynx, cough is usually absent; also in the presence of benign growths of the true cords and the subglottic space.

Treatment appropriate for the relief of laryngeal paralyses, the laryngeal complications of constitutional infections, or the surgical measures for the removal of growths, intubation, and tracheotomy will not be considered.

The attention of the writer was attracted to the use of the constant current through experience with its application in a case of acute laryngitis.

Early one Monday morning, a gentleman, introducing himself as an actor, with a week's engagement before him, but suffering

with all the symptoms of laryngitis, asked for professional advice in order that he might be able to perform his parts, which consisted of dialogue and song, the rôle of a comedian.

He was very hoarse—nearly aphonic, and presented all the aggravated symptoms of acute cold. It did not require an examination to verify the conclusion; the mucous surfaces were extensively congested, dry, and glistening.

The laryngeal appearances and conditions were fully explained to the patient, but the advice to cancel the engagement was declined with thanks. The condition was not local, by any means, and the most prudent advice pointed to at least a week's rest, with careful treatment, constitutional and local.

The gentleman was not so easily dismissed, and the method of treatment entered upon, and carried out, enabled him to complete a successful engagement, comprising six evening and two afternoon performances, the singing parts only being omitted.

No miracles were performed, but, in addition to the remedies indicated, the main reliance was placed on the use of the constant current, applied to the larynx with such relief and comfort that its use since then has been employed in several interesting laryngeal conditions.

Case I.—Dr. A. writes as follows:

"Early in May, 1894, after an exposure, I became hoarse as the first symptom of a cold, which did not start as my colds usually did; in the nose.

"I used simple remedies, thinking it would pass downward to the bronchi, and clear up, but it did not. The last week of June I began my vacation by a visit to the seashore, expecting the change would clear it up. The sea air even made it worse, and I came back in the middle of July, with more tenderness about the throat and as hoarse as when I went away.

"Under your treatment I began to improve at once. It showed itself first by remission of hoarseness, followed in the evening by an increase. This, at the end of three weeks, had all passed off not to return again; though I have had one severe cold with almost the 'Grippe' symptoms. This I contracted in New York, where the 'Grippe' was prevailing at the time."

This gentleman I have known personally for years. He is of good constitution, a persistent worker as a student, and in his profession; robust and active, with no predisposition other than colds. Hoarseness was the marked feature, and the laryngoscope showed signs of reddened cords, and increased congestion of the

upper part of the trachea. This condition was persistent, though atmospherical conditions were very favorable, as the treatment was maintained during the delightful autumn season, and, as the patient says in his note, the hoarseness was intensified each evening.

Treatment.—From two to three sittings each week for some time. No medication was employed, no symptom indicating any necessity for it; nor any application to the parts involved, except an occasional topical one to the nasopharynx.

Case II.—In January last, a gentleman, thirty-five years of age, actor by profession, consulted the writer for loss of voice as a result of an acute cold, which had passed through the purulent stage.

The conditions had not been benefited by laryngeal applications of silver and chromic acid to the pharynx, and the situation was serious from a professional point of view. He held the leading parts of the company, rehearsing daily at 10 A.M., with regular performances in the afternoon and evening—making ten and one-half hours of actual work each day. His voice was almost aphonic; the mucous surfaces of the nose and throat inflamed, the local cauterizations of the pharynx still visible. Larynx was in a high degree of inflammation, the vocal bands so swollen as to nearly conceal the true cords, which were intensely congested. The patient was unable to phonate without great difficulty, and pain referred to upper part of larynx.

The clinical symptoms were so unpromising that a speedy recovery of voice was not possible. The daily application of the constant current, with such remedies as were indicated, enabled the patient to meet his appointments; in twelve days the voice was clear; and at the end of three weeks, the congestion had disappeared and the tension of the cords became normal.

Case III.—J. M. L., forty-eight years, professional friend, whom I have known for twenty-five years, applied for relief from an irritable cough, and a tickling in the trachea just at the episternal notch. He is a sufferer from "that rare constitutional condition, a chronic inflammation of the mucous canals." [Mackenzie.]

He had passed through two severe attacks of pneumonia. A brother, younger, died from a tubercular laryngitis.

The least exposure to night air, fog, or any irritating atmospheric influences would excite the constant tendency to cough, the local point seeming to be in the trachea, over episternal notch.

The condition of the mucous surfaces of the air-passages

was that of acute congestion, with little or no secretion. Previously, the pharynx and nasopharynx had been vigorously treated by other physicians with strong solutions of nitrate silver. A cleansing spray, with the constant current applied, one pole over the episternal notch, the other to the back of the neck, brought prompt relief at each sitting.

In a note written January 26, 1897, he says:

"I wish especially to mention your treatment of my throat by the constant current. Those applications gave me prompter and more nearly permanent relief than any other treatment.

"I had been a sufferer from tracheal irritation and cough since boyhood."

Case IV.—Involvement of one vocal cord. The patient, a physician, writes as follows:

"My Dear Doctor: In reply to your request for a detailed account of the trouble with my larynx and vocal cords, from which I have been suffering, I beg leave to state that, so far as I can recall, the trouble began in the early Spring of 1890, with a partial loss of voice, unaccompanied by any appreciable soreness of the throat or any constitutional disturbance. You kindly treated me for the trouble at that time, and in the course of about a week the difficulty with my voice passed away. There was no return of the trouble until the following winter, when I suffered with several slight attacks lasting a few days and disappearing, sometimes with treatment used, and, again, without any treatment. This was the general history of my case up to the Winter of 1895. During this season I had several attacks of the laryngeal affection, which were more severe than before and less disposed to yield to treatment. Dr. Day, under whose careful treatment I was at that time, informed me that during these attacks there was a considerable degree of congestion of the vocal cords, sometimes on one side, sometimes on the other, and sometimes of both sides simultaneously. Accompanying the trouble with the vocal cords there was, usually, a considerable degree of tracheitis. The treatment which, as a rule, gave me most prompt relief during this period was intralaryngeal injections of a solution of menthol. Within an hour or so after the use of this preparation, the difficulty in using my voice would be greatly lessened; but this improvement would prove lasting only in part. All other treatment, which even so resourceful a practitioner as Dr. Day could suggest, was of little avail in relieving the symptoms, excepting, possibly, after a prolonged course of treatment. During the

Winter of 1896, I had more trouble than at any time since the affection began. The three or four attacks from which I suffered during that winter culminated, in March of that year, in an attack of unusual severity, which rendered it impossible for me to speak above a whisper for some three weeks or more. Although the acuteness of this attack subsided in the course of time, the trouble with the vocal cord which had been chiefly affected in this attack only partially disappeared; and until some time after I had been receiving the electrical treatment at your hands, a few moments' use of my voice above an ordinary conversational tone would exhaust it so that it would become impossible for me to continue. The condition of my vocal cords and larynx at the time you began the use of the electricity you know better than do I, and of this and the results obtained from that treatment you are too well informed to make it necessary for me to speak. As to the atmospheric conditions most likely to give rise to the trouble, I may say that they have usually begun during a period of damp weather; cold, clear weather seemingly having little effect in producing the attacks. The attacks came on suddenly, usually during the night. I would as a rule retire with little or no evidence of any laryngeal disturbance, and upon awakening in the morning would find my voice almost, or quite, gone."

Dr. E., the writer of this letter, is a man of fine physique and a professional acquaintance of some years. On his first visit his voice was quite hoarse, nearly aphonic, with a tracheal cough, expectoration scanty, a feeling of irritation over the episternal notch extending to the upper portion of the right lung. One or more glands along the right side of the larynx were slightly swollen and tender on pressure. His only complaint was either a complete or partial loss of voice, coming on, as he stated, suddenly, with attacks recurring *more* frequently.

The examination revealed a simple pharyngitis: also one healthy vocal cord, the left. The interarytenoid space was smooth, of normal color and appearance, with no swelling of the arytenoids.

The right cord was lacking those characteristic features which indicate its office: it had lost its tension, color, and firmness, as well as shape: appearing as a strip of fibrous tissue infiltrated with blood, in marked contrast with the color and healthy conditions of the remaining parts of the larynx. On the attempt at phonation it advanced but feebly to meet its fellow, and the husky tone shading off into complete aphonia. The mucous lining of

the trachea was inflamed so far as visible, and the feeling of weight or irritability over the episternal notch was so constant a symptom that it is reasonable to infer that the inflammatory process had extended downward along the tracheal walls. This irritability experienced over the episternal notch extended to the upper portion of the right lung; probably an extension of the inflammation along the lymphatic chain, the extent of which was previously noted by the presence of an enlargement of a few glands on the right side of the larynx.

The application of the galvanic current at stated intervals to the parts affected slowly alleviated the swollen glands and the tracheal inflammation. Laryngoscopic examinations made immediately before and after the use of the electrical current gave evidence of the bleaching process in the affected cord, which became more decided with each application.

By degrees the tension began to return and the voice became more flexible and resonant. It was especially interesting to watch the return of the normal shape and appearance of the cord. It is proper to add that the use of Vin Nourry Iodotane by this patient during the treatment was of great advantage.

Six months following last application of constant current, the right cord presents proper color and tension; on phonation it approximates the left normally, a slight blush of congestion passing over the cord during the act of phonation, while during inhalation the edge of the cord does not seem so sharply defined as that of the left.

This winter only two applications of electricity have been employed.

The galvanic current, as a curative agent in laryngeal and tracheal affections is:

(*a*) Easy of application;

(*b*) Soothing and agreeable to the patient;

(*c*) Relieves the congestion, pain, and irritation;

(*d*) Does not excite pain or spasm of the glottis or treachea;

(*e*) Relieves the swollen lymphatic glands;

(*f*) Cures more promptly than any other agent;

(*g*) Patients recognize its value, and return regularly for its application.

In the preparation of this paper, the writer has received suggestions from Prof. Stoerk's classical work, "Krankheiten des Kehlkopfs"; also from papers that have appeared in *Revue Hebdomaire de Laryngologie, d'otologie et de Rhinologie,* by Dr.

Castex of Paris; also from the *résumé* of a paper by A. Trifiletti, published in *Annales des Maladies de l'oreille, du Larynx, du Nez et du Pharynx.*

DISCUSSION.

Dr. Robert Levy, Denver, Col.: I think the Society owes a vote of thanks to Dr. Christy for his very excellent paper. It is not my purpose to say much about the treatment of dysphonia in general, but just a word in regard to the beneficial effects of the galvanic current in dysphonia, particularly in the case of the theatrical profession, in which case quick results must be effected. We must produce immediate results to satisfy our patients. I wish to call particular attention to that form of huskiness or hoarseness which often occurs early in cases of tuberculosis. I contend that this symptom is of great value from a diagnostic point of view. Anemia of the larynx and a slight huskiness of the voice, in connection with the pulmonary symptoms, is a diagnostic symptom of exceeding value. I think also that the hoarseness or huskiness of incipient tuberculosis may be caused by or dependent upon a slight infiltration of the arytenoid, and this also has a diagnostic value; but, of course, we must not conclude that this infiltration is necessarily tubercular, and it must be considered in connection with other tubercular symptoms. It is rare that we find patients, or even healthy individuals, whose larynges do not show some infiltration from chronic catarrhal laryngitis. The huskiness dependent upon this condition may not be noticeable to the patient, unless a singer or an actor, but in all cases of suspected tuberculosis, the physician should not let this diagnostic symptom be lost sight of.

Dr. E. E. Holt, Portland, Me.: I think the discussion is in regard to the use of the continuous current. As the Doctor was reading his paper, I recalled to mind a patient I had some time ago, a lady, who had difficulty with the voice, due to an enlargement of the thyroid gland. She consulted me because she was not able to use her eyes. I examined her eyes very carefully, but could find no abnormality there, but I applied the continuous current. She received so much benefit from it that she insisted upon returning, and, to my surprise, the enlargement of the thyroid gland began to diminish. Although she had been under the treatment of competent physicians for that trouble, she insisted upon returning to me for my treatment. I only mentioned this to show the value of the continuous current. I find it useful not only in preachers and those who use the voice, but also in difficulties of the eyes. I have been able to produce benefits by the use of the current which I have not been able to produce in any other way.

PAPER:

MODERN POSSIBILITIES IN CHRONIC CATARRHAL DEAFNESS.

BY SARGENT F. SNOW, M.D.

The dismal prognosis given in cases of chronic catarrhal deafness by many authorities has restrained us from placing on record some conclusions which, for the past five years, have been making themselves manifest. Even now, a paper on the subject is advanced with humility, begging that you will overlook apparently radical or dogmatic assertions, for they come at least from honest convictions.

Ancient and modern literature on this subject is well known to you all. The valuable work done by these eminent men is fully appreciated, and is being utilized in our attempt to get more favorable results in so-called hopeless cases—we say *is being utilized*, because the technique of work and treatment used are in no wise original or peculiar to ourselves. Simply a *more persistent* application of the rational methods adopted by most progressive aurists of the day.

Within the past few years much has been written in relation to operative procedures within the middle ear to relieve those cases having distorted, ankylosed or bound-down ossicles; but very little has been said regarding those that might be termed "non-operative" cases of chronic catarrhal deafness.

A paper is now presented with the hope of reviving interest in a condition so neglected, yet so common, and so worthy of our best efforts; also with the thought of bringing to your notice a sample of the results being obtained, and which I believe others will get, and are getting, if they encourage their patients to submit to a complete removal of nasal causes, and persevere in proper tonic and alterative treatments to the membranes.

The term "Modern Possibilities" is made use of in the title, for it is due to recent advances in therapeutic and surgical science that old traditions are being overcome.

Close on the discovery of the anesthetic properties of cocaine, came the improved facility with which the nasal and postnasal passages could be made healthy. Following along this line, it was found that acute and subacute cases of catarrhal deafness

were very much benefited, and usually promptly cured, by improving the condition of the membranes of the nose. In the more chronic cases, we were often taught that if, after inflation, the hearing were not improved, or if, after a course of treatment by generally accepted methods for six weeks, the patient showed no material benefit, it was a hopeless case and wrong to encourage him to continue further. With this point we could take issue, for in most chronic cases of catarrhal deafness, a six or eight weeks' course of treatment will not, to much extent, improve their hearing power; whereas, a *thorough removal* of pathological conditions within the nose and adjacent cavities, followed *persistently* from month to month, and if necessary from year to year, by proper stimulating sprays to the nasal membranes, and vapors through the Eustachian tube to the middle ear, will, in a good percentage of cases, tone up the parts and bring, if not a complete cure, happy results.

Many a time we have followed the old rule, given the six-weeks' course of treatment, discouraged our patient, and sent adrift what, in the light of present knowledge, would be a favorable case, to become the prey of some enterprising quack.

Another tradition handed down to us is, that if we find bone conduction diminished, the prognosis is unfavorable. In not a few instances this has proved to be an unreliable rule, the neuritis clearing up promptly with the removal of tubal and tympanic trouble.

To illustrate some of the foregoing points, three decidedly chronic and unfavorable cases have been selected from our records that represent different periods in life, aged, respectively, twenty-four, forty, and fifty-three, the last two surely being beyond the age in which would occur resolution of the trouble through Nature's processes. A complete history covering such long courses of treatment would be too tedious to incorporate in this paper, so a brief *résumé* and some general observations will be made, taking them up in the order named.

Case I.—Miss M., aged twenty-four, came under treatment March 28, 1894, with history of much deafness in left ear for six years, and in the right three years, together with roaring and chirping sounds in the head, with no apparent change during previous ten months.

Examination showed enlarged middle turbinates, puffy membranes, granular pharynx, etc. Right drum red around edges over malleus and considerably depressed. Left drum not so red,

but more opaque. Ossicles movable in each ear 50 per cent. Air and bone conduction about equal, bone conduction slightly below normal in each ear. In the right ear she could hear numbers of two figures spoken in conversational tone 6 inches, in whispered voice 2 inches. In left ear spoken voice 4 inches, whispered voice 0; slight, if any, improvement after inflation.

January 7th, a period of nine months, during which time the operative work in the nasal passages had been completed and the parts healed, an examination showed a gain in the right ear of only 2 inches, and 6 inches in the left. She was then given *daily* treatments of camphor and iodine vapors through the Eustachian tube for five weeks, when a gain of 9 inches in the right ear was noted. This was significant, as previous attempts with bi-weekly treatments had failed to do much good.

Owing to financial reasons the patient was only seen at irregular intervals for short courses of treatment after February 15, 1895, to December 29, 1897, when she reported an almost entire absence of the noises in her head, freedom from colds and catarrhal troubles, though physical appearance remained about the same; the left ear had gained 12 inches for whispered, and 16 inches for spoken, voice; the right ear 14 inches for whispered, and 24 inches for spoken, voice. Time under treatment, three years and nine months.

Case II.—Prof. C. came under treatment June 4, 1895, complained of deafness of thirteen-years' standing, coming on after severe exposure. Reported that for twelve years to above date hearing had remained about the same, but could be temporarily relieved by Valsalva's method of inflation.

Examination showed the common intranasal thickenings and postnasal inflammations. Ear-drums much depressed, dry, and thin. Ossicles in right movable about 20 per cent., in left 30 per cent. of the normal.

Right hearing distance was 0 for the whispered voice, politzer's accumeter 20 inches. Left hearing distance 5 inches for whispered voice, accumeter 26 inches. Right ear not improved by inflation. Left ear improved 3 inches for whispered voice.

September 7, 1895, first test for hearing after nasal passages were put in shape surgically, showing no material improvement. Treatments were continued, with slight exceptions, twice a week until November 5, 1897, a period of two and one-third years, when examination showed right hearing distance to be 50 inches for whispered voice, accumeter 20 inches. Left hearing distance 120

inches for whispered voice, accumeter 30 inches. A gain for whispered voice in right ear since beginning treatment, June, 1895, two and one-half years, of 50 inches. In left ear 115 inches.

Case III.—Mrs. A., aged fifty-three, came under notice October 12, 1892. Complained of extreme deafness, ringing, roaring, and a variety of noises, which had remained about the same for fifteen years, in the right ear, but the left ear became a little better and remained so until four years previous to examination. Right drum depressed, cloudy, and fibrous in appearance, with redness around edges and over malleus. Ossicles movable 20 per cent., light spot $^1/_3$ normal size. Left drum was not so cloudy, but the malleus was prominent, light spot ½ normal size.

Testing the ear showed the right hearing distance for numbers in spoken voice to be 4 inches. Left hearing distance 12 inches. Bone conduction in the right ear appeared to be 20 seconds, and in the left ear 15 seconds below normal. Nasal passages contained numerous thickenings, with consequent postnasal and pharyngeal inflammations. Inflation appeared to double the power of hearing in the left ear. The usual operative course in the nasal passages was gone through with until July 6, 1893, when right hearing distance for spoken voice had improved from 4 to 8 inches. Left hearing distance from 12 to 32 inches.

She then became irregular in her attendance, only taking a biweekly course of treatment for a month or so, when she felt her deafness increasing. The intervals between relapses became longer, until sometimes she would go for three months without treatment, and with no apparent loss in hearing.

On December 5, 1896, tests showed a gain in right ear of 32 inches, and in the left of 76 inches, from three and one-half years of very unsteady treatment. An examination was made at this time for whispered voice; right ear 24, and left ear 80 inches; the nasal and postnasal membranes were in good shape, with almost an entire absence of noises within the head; another two months' treatment was given, followed by a lapse until June, 1897, when it was found that in the previous six months she had gained for the whispered voice 8 inches in the right ear, and 60 in the left. Also, since beginning of treatment, October 12, 1892, a gain for the spoken voice of right ear 44 inches, and left ear 276 inches, or 23 feet. Last October she dropped into the office to say that she could see no need for treatment as there was a steady improvement.

The choice of the three foregoing cases from many to illustrate "Modern Possibilities in Chronic Catarrhal Deafness" was made:

1. As I said before, because they represent three distinct periods in life.

2. Because they were each of them cases of long-standing deafness, decidedly obstinate and chronic in character; others, apparently as deep-seated, having responded much more promptly.

3. Because each presented well-marked pathological conditions within the nose; and

4. Because records show that in each case I had tried to relieve them by the usual method of inflation, vaporizing, etc., for a period of two months, without material benefit.

With the case of the young lady, particular attention is called to the improvement obtained in five weeks from daily treatment, right ear 9 to 18 inches, left ear 10 to 20 inches, and would say that I have tried this active plan in several very obstinate cases with good results. The total gain in her case was, left ear from 4 to 20 inches, right ear 10 to 30 inches. Time under treatment three and three-fourths years.

N. B.—February 1, 1898. Since writing this paper, which was read before the Eastern Section of this Society in Albany, January 24th, the patient presented herself again after a lapse of six months.

Careful bi-weekly treatments were given for four weeks, when examination showed a gain in the right ear of 4 inches, and in the left of 10 inches.

This was interesting, because the auscultation-tube had told me at each treatment that the vapor was entering the middle ear freely, while in the right side the membranes of the Eustachian tube were so swollen that several treatments were given before the middle ear was reached; that the improvement of 4 and 10 inches was commensurate with the success of the applications, and, further, that bi-weekly treatments in her case now bring greater results than could be obtained by daily treatments three years ago.

In Case II., particular note should be given to the degree of deafness, its long standing—thirteen years—and to the amount of improvement from a shorter course of treatment, two and one-third years, 50 inches in the right ear and 9¾ feet in the left, due, no doubt, to the persistence and regularity with which the patient kept to the work.

In Case III., the lady had reached the age where we should be very careful in giving a favorable prognosis, but the result obtained, a gain of 44 inches in the right ear and 23 feet in the left ear, teaches us that even those of *advanced* age are *sometimes amenable* to treatment.

Another point is Nature's kindliness in bringing about regenerative changes of her own accord, if thorough nasal work has been done. Since July 6, 1893, the treatments were irregular, and only just enough to restore tone to the membranes of the nose and Eustachian tube when they became relaxed; this was necessary for a time every two or three months; latterly, once in three months. Experience teaches that with regular and persistent treatment, two or three times a week, our result would have been still more pleasing.

The question does not seem to be so much whether we have an atrophic or hypertrophic condition, *but did* the deafness primarily occur as a catarrhal inflammation, or is there so much fixation of the ossicles as to *preclude* a possibility of relief, except through operative procedures?

If examination shows that the trouble *be* a catarrhal process, and there is a chance of stretching adhesions, absorbing inflammatory products, etc., with the patient's faithful coöperation, each year's added experience has given us *more* courage to make a favorable prognosis.

Many practitioners are opposed to the treatment of deafness in particular, and catarrhal affections in general. This influence is felt in families, and, in those cases where prompt, energetic measures are *imperative*, may become pernicious. Their opposition is honest, and comes from the unfavorable prognosis given by authorities for whom they have great respect. We *maintain* that the *conclusions* of *these authorities were based* on experience obtained under auspices *much less favorable* than the present; their *every effort* on the ear was hampered by recurring catarrhal inflammations which to-day we can, in a great measure, control.

Treatment of chronic catarrhal deafness may be divided into three stages: (1) The stage in which the necessary nasal operations are done; (2) the stage in which we await the result on nasal and postnasal membranes of the operative work, relieve tubal occlusion; (3) that stage where we find that we have at last succeeded in building up the membranes so that they have more inherent power to throw off inflammations. This is a period at which, for lack of perseverance, but few cases arrive, the period

being attended by so many discouragements that both the physician and patient are put to the test; but it is the *only* period in which we can *satisfactorily apply treatments* to the middle ear.

In the first or second stage of treatment in these hard cases little gain in hearing power need be expected; if some be obtained it is usually transient, though it seems best to carefully inflate and vaporize the middle ear at each favorable opportunity. With that great army of chronic cases showing a lesser degree and shorter duration of deafness, correspondingly easier and quicker results will be obtained.

The tendency to gradually drop back to their old state, if left to themselves, will depend upon their physical condition, climatic environment, and the relation we get their membranes to bear to the normal. With moist atmosphere and sudden variation of temperature, care may be necessary, but numerous observations show that this is not a great hardship, as the relapses become less and less frequent.

As to methods and means adopted, we shall offer nothing particularly new, but would say that for reducing congestion, or restoring tone to the membranes, a light spray of iodole and ether, two grains to one ounce (see "Headaches from Nasal Causes," by the author, *The Medical News,* July 10, 1897) applied to the nasal and postnasal membranes, and a vapor of camphor and iodine carefully and thoroughly injected through the Eustachian tube into the middle ear, appear to be very serviceable. (See "Diseases of the Ear," Dench, page 310.)

Finally, "Modern Possibilities in Chronic Catarrhal Deafness" appear much enhanced by the enlightened work being done on pathological conditions within the nose. An unfavorable result from a six or eight weeks' course of treatment is not a safe criterion for prognosis.

Nature is a prompt and ready assistant, if she be unhampered by coexisting nasal inflammations, and, with practically restored normal membranes, the problem becomes one amenable to treatment.

DISCUSSION.

Dr. E. E. Holt, Portland, Me.: I think the Society owes a vote of thanks to Dr. Snow for his paper, as this subject is not generally considered a very inviting one upon which to write. In taking into consideration whether or not this class of patients can be benefited by treatment I am guided usually by whether or not they are made worse by a cold. If a case of chronic catarrhal inflammation of the middle ear is not affected by cold in the head

there is, in my experience, but little chance of improvement by treatment. There is a class of patients that offers no encouragement, and in deciding upon these cases we must take into consideration the family history and hereditary tendencies. I have in my mind a family living in my city, all of them became deaf, and they do not suffer from the ordinary symptoms of catarrh, and any member of this family is not made worse in hearing by a cold in the head. I think Dr. Snow's suggestions are very valuable, because most physicians discourage any attempt to benefit patients afflicted with catarrhal deafness, simply because some of these patients are known to be incurable. I think in the light of modern treatment that many of these cases can be benefited—can be made to hear better. I did not notice that the Doctor said anything about galvanism in his paper, I think if he adds that to his treatment he will be able to help some patients whom he would not be able to improve in any other way.

Dr. JAMES F. MCKERNON, New York: I would like to ask the Doctor about the conditions of the tube previous to the beginning of the treatment. Was there any stenosis whatever?

Dr. S. F. SNOW, Syracuse, N. Y.: There was no permanent or protracted stenosis in either of these cases, but I have had several other cases where there was a good deal of stenosis, and I had to stretch them. These particular cases had no fibrous stenosis. There was almost complete occlusion for a time in the case of the elderly lady, and in the case of the young lady one tube was occluded for a long time, although it finally yielded to treatment.

Dr. MAX THORNER, Cincinnati: I think Dr. Snow has been unusually successful in the treatment of his cases; I am sorry to say that my experience is not as good. It may be that I have not continued my treatment of cases long enough, not as long as he has. I believe, however, we have to differentiate between the different kinds of cases. If we have obstructions of the nose in these cases, with the nasopharynx and the Eustachian tubes congested, or their mucosa thickened, we are very likely to improve our patients by removing the obstruction, and by treating the chronic pharyngitis and salpingitis. The judicious use of the probe in the tube is often of benefit in such cases, but patience is required. If we do not succeed at first we must try again. Good results are also liable to result from the faithful employment of massage of the Eustachian tube. But there is a class of cases which does not offer so much hope to the patients; cases in which an inflammatory condition has run its course, resulting in an atrophic condition of the walls of the Eustachian tube, where the drumhead is retracted, where the chain of ossicles is anchylosed, in short where sclerosis of the middle ear exists. I do not think we can expect very good results from treatment in these cases. It is my experience that these cases of gradual, progressive deafness offer a very poor prognosis. However, I have gleaned some information from Dr. Snow's paper which I shall be pleased to try in my practice.

Dr. CHAS. W. RICHARDSON, Washington, D. C.: I was pleased to hear Dr. Thorner's remarks on this paper. I think many of us have had cases of gradual, progressive deafness, which go on from bad to worse, in spite of all that we can do for them, in spite of any treatment which we may institute. These are cases of the sclerotic type, attended with sclerosis of the mucosa, anchylosis, fixation of the stapes, and changes in the round, and oval window. No doubt all of us have met with these cases, where our best efforts are of no avail. We have, of course, many remedies to alleviate, if not to cure, these cases, but, in my experience, it has been very hard to hold patients under treatment for any length of time if some good results are not produced to give them courage, more especially when the Doctor, himself, cannot offer much hope from his treatment. I have seen, in some of these cases, where iodine-camphor vapor has been employed, a marked increase in all their symptoms. I believe that in certain cases of inflammation of the tube and of the middle-ear cavity, the solution Dr. Snow speaks of and the treatment which he outlines is of value; I think it extremely hazardous to attempt the same line of treatment in the sclerotic cases. I have seen a number of cases where this treatment has been harmful. Of course, as a rule, we only hear of cases where our treatment does good; we do not generally hear of the cases where harm is done; in some cases I have found it decidedly harmful.

Dr. S. F. SNOW, Syracuse, N. Y.: I thank you very much for the kindly way in which you received my paper. One point which I wish to emphasize is the necessity of doing thorough nasal work in cases of catarrhal deafness. I am more convinced every day that if we do our nasal work thoroughly, good results will come in most cases of disease of the middle cavity, though we must not expect too much the first three or four months after operative work. If we do not cure the nasal trouble, our treatment of the ear cavity will be of little avail—our best efforts will only bring temporary improvement. Dr. Richardson speaks of the increase of the tympanitis and in the deafness which sometimes follows the use of camphor and iodine vapor. I have noticed this, but am convinced that it does no permanent harm. The counter-irritant effect actually toning up the membranes, which soon become tolerant, and the patient is in better condition than when we started.

PAPER:

A CASE OF RHINOPHARYNGEAL FIBROMA WITH PROJECTIONS EXTENDING TO BOTH ANTERIOR NARES.

BY HANAU W. LOEB, A.M., M.D.

The following case of rhinopharyngeal fibroma I present by reason of the unusual growth of the neoplasm through both nostrils. Cases have been reported of fibromata extending in their growth through one nostril, into the antrum, into the cerebral cavity, into the pharynx and into the other accessory sinuses, but so far as I have been able to observe, there is no record in literature of such a tumor growing through both nasal cavities and extending anteriorly through both nasal cavities and extending anteriorly to both anterior nares.

A. M., æt. 13, first consulted me on October 16, 1892, being referred by Dr. Hugo Summa of St. Louis. For three months the patient had been suffering from complete nasal obstruction which had evidently developed somewhat abruptly, as the patient gave no history of previous partial obstruction. However, before the total obstruction appeared, she experienced severe headaches which were quite persistent and which affected the frontal region. These headaches were not increased by coryza, nor did they seem to be dependent upon a gastro-intestinal abnormality. There was no discharge from the nose, however, until several months before, when crusts formed in considerable number and the masses were daily blown out of the nose. The sense of smell had been absent for three months, or since the total obstruction first appeared. There had been no aural or pharyngeal symptom present.

Three weeks after the patient consulted me, it was evident that there was a growth at the entrance of both anterior nares.

The family history was good, the parents being healthy and able-bodied Germans. Previous history was negative.

Examination revealed a large hard growth projecting from each nostril, almost filling up the entire vestibule. The outer wall of each nasal cavity was entirely invisible and the septum could barely be seen. Both portions were slightly movable and bled upon the slightest touch. Mouth, palate, and pharynx exhibited nothing abnormal beyond what would result from oral

respiration. The postnasal mirror revealed a round, smooth, pinkish mass filling the upper and anterior portion of the rhinopharynx.

Digital examination disclosed a hard, smooth growth, about the size of a walnut, which seemed to straddle the septum, sending one projection through each choana. It had an evident attachment to the vault of the pharynx and was not movable.

As a venture, and for diagnostic purposes, a portion was removed from the mass in each nasal cavity by means of the writer's electrocautery snare. Dr. Summa, to whom the specimen was referred, made the following report:

Sections made from different parts of the tumor kept in dilute alcohol, and sent to me shortly after being removed by Dr. Loeb, gave such similar pictures that, for the recognition of the histological structure of the neoplasm, the description of one section will be sufficient. It is worth while to mention that there was a most pronounced blood-supply in the mucous membrane spread over the new formation. The preparation of the specimen was performed by hardening in alcohol of gradually increasing strength, and staining with hemotoxylon and eosin. The two essential tissues of which the tumor is composed are: first, connective tissue, which in most places is characterized by being exceedingly poor in connective-tissue corpuscles—only the tissue around the second chief structure is characterized by concentrically arranged fibrillæ with a greater number of connective-tissue corpuscles interspersed. In this place a small cell infiltration is a prominent feature.

Second, the other chief structure represents glands which are characterized first, by the large size of their respective lumina; second, by being distinctly branched and third, by being lined with several layers, sometimes as many as five, of epithelial cells with the cylindrical type predominant.

The relative proportion between the glandular and the connective tissue was such that each formed about half of the tumor, so that from the standpoint of terminology, no objection can be made to calling the tumor either fibroma adenomatosum cysticum or cystadenoma fibromatosum, and considering the large number of blood-vessels in the more superficial layers of the neoplasm, it seems proper to speak of the tumor as a cystadenoma fibromatosum vasculosum.

Following old lines, electrolysis was first used, with a sponge on the neck or face and a needle inserted into the tumor. Through-

out the treatment the negative pole was used for application to the growth as it was found that hemorrhage was less abundant after its use than when the positive pole was brought into requisition. This plan of treatment was continued every other day from October 24th to November 4th, eight cells of a Waite and Bartlett dry chloride of silver battery being used at first, and later this was increased to twenty. The result of this course was a slight decrease in the size, and evident diminution in the tendency to bleed. It was accordingly determined to resort to excision. On November 6th, 20th, and 27th, and December 4th, masses varying in size from a pea to a large filbert were removed by means of the writer's electrocautery snare. After this electrolysis in greater quantity (35 cells) was administered until January 6, 1893, subsequent to which time sections of the growth were removed by means of the electrocautery knife.

On November 27, 1893, she was discharged with no evidence of any remaining portion of the growth.

Throughout the entire course of treatment nothing intervened either as sequela or untoward effect which interfered with the line of action.

Status Præsens (Dec., 1897).—Nasal respiration entirely free and unobstructed. Mucous membrane of left nasal cavity somewhat hypertrophied, though the inferior turbinated is very small. There exists an adhesion about an eighth of an inch wide between the lower portion of the left middle turbinated and the septum. The right nasal cavity shows considerable atrophy and is very capacious; the inferior and middle turbinated are considerably reduced in size. Rhinopharynx presents no evidence whatever of any growth, being clear of all extraneous masses. Olfaction normal. General health improved.

PAPER:

PRIMARY EPITHELIOMA OF THE ANTRUM OF HIGHMORE, WITH HISTORY OF A CASE, AND TWO CAMERA-LUCIDA DRAWINGS.

BY WENDELL C. PHILLIPS, M.D.

Tumors of the superior maxillary bone have attracted the observation and taxed the skill of surgeons for many years. In the earlier years all tumors in this region were supposed to have their origin in the antrum of Highmore—even those which we now know to be primarily located in the ethmoidal or sphenoidal cells, as well as in other adjacent regions and tissues.

Primary sarcoma of the antrum, while not infrequent, is sufficiently common, so that every observer will occasionally see cases. It would seem that the earlier observers did not carefully differentiate between sarcoma and epithelioma, and quite frequently, where the diagnosis made was epithelioma, the actual report more nearly described sarcoma.

A careful research of the literature on this subject has brought to light a few more or less authentic cases of primary epithelioma of the antrum which have been reported in detail. Short abstracts of these cases will be made a part of this paper.

So good an authority as Heath[1] ("Diseases of the Jaw") states that "the only form of true cancer invading the upper jaw is, in my experience, the medullary or encephaloid; but scirrhus has occasionally been met with, of which preparation 1059 *E*, in the College of Surgeons' Museum, removed by Mr. Coates of Salisbury, is believed to be a specimen. In the majority of cases the disease begins in the antrum, for the protruding masses which are found in the nose or mouth are but secondary to a formation within that cavity. Medullary disease of the jaw closely resembles the same disease in other parts of the body. Rapidity of growth, with softness and a tendency to fungate on the part of the tumor itself, are the main characteristics."

The tumors described and the cuts shown in his book would seem, in nearly all cases, to indicate sarcoma rather than epithelioma.

A thesis by Morel[2] ("Contribution à l'Etude des Epithéliomas du Maxillaire Supérieure, et en Particulier de l'Epithélioma

Térébrant") states that epitheliomata may originate under the periosteum or in the spongy portion of the maxillary bone; in the latter case, either in the substance of the bone itself (central or intraosseous epithelioma), or in the alveolar portion.

"Epitheliomata may also originate in the antrum, either taking their start in the epithelial layer covering the mucosa or in that lining the glands."

The writer makes these as general statements, but cites no cases in support thereof.

He next discusses the boring or penetrating form ("térébrant") of epithelioma of the superior maxilla, and gives details of a few cases. But he says that no autopsy was made in any one of these cases, and *it is therefore impossible to say with certainty whether the morbid growth originated in the antrum—primary epithelioma of the antrum—or not.*

He adopts the theory of Verneuil, for lack of a better, as the most probable hypothesis on which to account for the origin of "épithélioma térébrant" of the superior maxilla. According to this theory, these growths originate in the cysts which are frequently seen at the roots of the teeth—cysts which are developed from epithelial *débris*, the remains of developmental processes.

This thesis contains only general statements as to the essential point sought for. The author quotes what others have said as to primary epitheliomata of the antrum, but cites no cases of indubitable primary epithelioma of this region.

Lawson[2] ("Epitheliomatous Tumor of the Upper Maxilla," treated by excision of the disease and the application of escharotics) reports a case, some of the characteristics of which would seem to indicate epithelioma; but as no microscopic examination was made, the case cannot be considered authentic. A few details, however, will be given.

Male, sixty-five. For two months severe toothache in left upper jaw. No relief from extraction of teeth, after which a swelling appeared in the mouth above the alveolus. When admitted, there was a soft, elastic tumor, about the size of a small egg, and evidently growing from within the antrum. The bone over it had been partially absorbed. Could blow clearly through the left nostril. There was no displacement of the eye. There was a small, soft tumor, about the size of half a walnut, in the mouth above the alveolus. Incision into the latter evacuated some pus, blood, and soft, broken-down tissue, and revealed an opening through which the finger entered into the antrum, which was

found to be completely occupied by a soft tumor. The growth was excised, actual cautery applied, and then chloride of zinc paste. Twice recurrence was checked by hot iron and chloride of zinc paste, and in a little over three months patient was discharged cured. Four months later there was no sign of recurrence.

Reclus[4 5] (*Epithelioma of Maxillary Sinus—Epithélioma Térébrant*) reports two cases of epithelioma of the maxillary sinus, and speaks of them as "épithélioma térébrant." Both cases evidently occurred in the service of Verneuil.

Case I.—Male, sixty-nine years, good general health. Consulted M. Verneuil in regard to an ulcer of the left alveolar process. Had had dental neuralgia ever since fourteen years of age; the teeth had by degrees become carious, yet those in the lower jaw were in good condition. It was decided to extract the roots of the molars. The extraction was followed by a sever hemorrhage, but a discharge continued many days, which by degrees became purulent. Three months later he presented himself for our observation. We found that the lesions were confined to the upper maxilla; again, the bone is not invaded—at least, in appearance. With regard to the large molars, we know that since the extraction of the roots hemorrhages have occurred, with a discharge of purulent matter. The border of the alveolus is destroyed at that point; also the fungous ulceration. This ulcer occupies strictly the position of the three large left molar teeth. It is longest antero-posteriorly, 45 mm. by 10 to 12 mm. transversely. It is excavated in its center, but at first there was not a suspicion of an orifice. A fistulous opening was found after some search, which led into the antrum. The probe moved freely about in this cavity, and no denuded bone was discovered. But there was an irregular fungoid maxillary membrane. There was no external deformity—at least, there was no abnormal protrusion. There was nothing special about the wall of the nasal fossa, the turbinates being normal, and the patient had never been conscious of pus discharges from the nose: but the discharge from the mouth is nearly continuous, consisting of pus, sometimes discolored by blood and fetid *débris*, which was examined microscopically by Dr. Nepven, who recognized clearly the characteristic epithelial bodies.

M. Verneuil thought of a radical operation—the removal of the superior maxilla—but a glandular mass about the carotid vessels caused him to abandon this project.

Case II.—Epithelioma of the Antrum, marked by intense pain, with a fistulous opening through the alveolar border, escape of bloody fluid and pus. Multiple operations, recurrence, and death.

Female, fifty-nine years. Has always had bad teeth, which have been extracted one by one from the upper jaw. A dental plate induced an irritation of the alveolar process. Nevertheless, in spite of the pain, the patient wore it until three months before her entrance into the hospital, when she was seized with a violent pain in the left upper jaw, which radiated to the orbit and the auditory canal. About this time the patient noticed an abnormal swelling at the alveolar border of the superior maxilla, and there was also a narrow orifice with a border of fungous granulations. Verneuil diagnosticated necrosis of the alveolar border, and enlarged the opening for the purpose of finding and removing the sequestrum; but instead of this his finger entered a cavity lined with fleshy granulations, which were removed with a blunt instrument. M. Longuet examined them histologically and pronounced them papillary epithelioma. M. Nepven examined a recurrent granulation and pronounced it the same.

This operation made no difference in the progress of the tumor —a constant fetid, bloody discharge into the mouth, always of a repulsive odor, and the red, soft vegetations developing about the orifice of the fistula. Pain was very severe, radiating to the eye and ear. Verneuil repeated his first operation and curetted away the fleshy granulations, and renounced his former opinion that this cavity was other than the maxillary sinus. Later, Verneuil removed a large part of the maxillæ, but was unable to remove the tumor completely. During the following day she complained of severe pain in the pharynx and dysphagia, and finally died.

Reclus also suggests the name "épithélioma térébrant," on account of its burrowing its way from the alveolar process into the antrum, but without widening the bone or distending the antrum. He suggests, or possibly Verneuil suggests, that the growth has its origin in one of the cysts which are so frequently attached to the roots of the teeth, and which are probably derived from epithelial *débris.*

Englisch[6] (*Epithelial Carcinoma in Left Antrum Highmori; Cure*).

M. K., female, married, aged thirty-four. Patient was operated on in September, 1878, because of formation of cysts in the left antrum Highmori. Noticed a short time thereafter that

the left cheek began to swell and that it was impossible to draw in air through the left nostril. Later, the left eye began to tear profusely and the swelling increased rapidly.

Status Præsens.—Patient well nourished; feverish. The left side of the face in the region of the nose and zygomatic arch, greatly swollen. Directly beneath the zygomatic arch there is an ulcerating surface, about the size of a kreutzer, uneven and covered with crusts. In the center of the ulcerating surface there is a small opening, through which the superior maxilla can be reached with a sound. The left nasal cavity is filled with granulating masses. No teeth on the left superior maxilla. From the alveoli of the left molar teeth there is an entrance into the antrum through which granulating tissue proliferates.

April 19th.—Operation was performed without narcosis, after the patient had recovered from an attack of facial erysipelas. The soft tissues of the cheek were divided by an incision from the center of the zygoma toward the left corner of the mouth. The ulcerating area was surrounded by two oval incisions, and the flaps formed by this procedure were dissected away from the underlying tissues and thrown back; this made the antrum easy of access. After the tumor was peeled out with the aid of an elevator, the mucous membranes of the nose, cheek, and the tear-ducts, into which the growth had also proliferated, were curetted with a sharp spoon, and all the diseased tissue thoroughly removed. The bone itself was intact. The antrum was tamponned with "charpie hémostatique," the cheek-flaps united by sutures, and the wound covered with cotton, saturated with two per cent. carbolic-acid solution. The microscope confirmed the diagnosis.

April 22nd.—Chill; left eyelid swollen.

April 23rd.—Beginning of an attack of erysipelas.

May 1st.—Erysipelas disappeared, but region of lower jaw began to swell.

May 6th.—The swelling fluctuated and was incised—a large quantity of pus with necrotic tissue from the fascia of the neck removed. Patient recovered gradually and left hospital June 9, 1879.

Butlin's case[7] (*Squamous Epithelioma of Upper Jaw*) was a male sixty-two years of age. Had had pain in right cheek and upper alveolar process for several months. A small opening was found in the situation of the alveolus of the second molar, from which there was a foul discharge. A sinus led into the antrum,

which was filled with pus, and what appeared to be firm granulation tissue, which a month later was found to be epithelioma. Upper jaw removed, but patient died five days later from exhaustion. Shortly after the first examination of this case a puffy swelling appeared in the tissues between the malar bone and nose, immediately below the orbit. He says: "In spite of the absence of the ordinary signs of tumor of the antrum, the jaw was entirely destroyed with the exception of a part of the alveolar process. The disease extended through the lower wall of the orbit to the eye, into the spheno-maxillary fossa, and up between the temporal and masseter muscles and beneath the temporal aponeurosis. Sections made from different portions of the tumor showed everywhere the structure of squamous epithelioma, containing many cell-nests."

There seems to be some doubt as to whether this growth was primarily in the antrum, but the initial symptoms of pain in the alveolar regions would point strongly to such origin.

Ziegler's case[8] (*Cancer of the Antrum*) presents some data pointing to true epithelioma, but as no microscopical report is given, and he simply describes it as cancer of the antrum, it cannot, with any degree of certainty, be cited as a case of primary epithelioma of the antrum. The case is similar to several described by Heath and Ziegler.

The patient was a male aged forty-eight years; had complained of toothache for three months, which was not relieved by extraction of a decayed molar. A probe being passed into the antrum, there was a discharge of pus from the nostril. In a month a small body, apparently composed of granulations, projected from the socket of the extracted tooth. Shortly after the remaining teeth on that side became loose and dropped out, and the sockets were found to be occupied by a continuation of this granulation mass, which grew rapidly, and soon filled his mouth to such an extent that it was only with difficulty that he was able to bring his lips together.

A month later an opening occurred through the cheek, surrounded by large fungous granulations; eye protruded, and cheek was greatly swollen; lips wide apart. He became comatose and died about a month later.

Trelat's case[9] (*Epithélioma du Sinus Maxillaire*). Female, aged sixty-two years, noticed about June, 1881, a slight swelling of the left cheek, just below the eye, with some redness and pain. The skin in the vicinity of the lower lid was slightly edematous,

and somewhat adherent to the tumor. The eye did not seem to be displaced, and vision was not affected. The pain increased rapidly. Exploratory puncture obtained a moderate amount of blood, but no pus. It left a fistulous opening, through which a probe penetrated to a depth of five centimeters into a soft tissue, which was removed piecemeal by instruments. The diagnosis epithelioma of the antrum was made, and the diagnosis proved to be correct.

There seems to be considerable doubt as to whether this case was primarily one of the antrum, and the report does not distinctly say that a microscopical examination was made.

Bardeleben[10] (*Carcinoma Maxillæ Superioris Sinistræ; Extirpatio Maxillæ Sup. Sin. et Resectio Partialis in. Dextræ*) reports at length a case as follows:

Male, fifty-seven years. Five months previously had noticed a painful swelling in the left upper jaw, which grew rapidly. When he came under observation the left upper jaw was occupied by a bulbous and very soft growth. The eye was protruding, the teeth of the upper jaw were absent, the alveolar process was spongy, and the neoplasm occupied the hard palate beyond the median line and also the lateral walls of the throat. Patient complained of severe pain. General health good.

Dieffenbach's operation was performed. Microscopical examination showed the tumor to be carcinomatous; recurrence in six months.

The rapid growth, the extension of the disease, as shown in the full report of this case, would incline one strongly to the opinion that it was one of sarcoma rather than carcinoma, although the microscopical report is that of carcinoma.

Robbin's case[11] (*Carcinoma of Antrum*), while reported as one of carcinoma of the antrum, would indicate from the history that the disease began in the tissues adjacent to the antrum. There is no history of an opening through the alveolar process, and his statement that it appeared on the left cheek, soon involving and destroying the nose, encroaching upon the fauces to such an extent as to render deglutition difficult, as well as respiration, bears out this impression.

Verneuil[12] (*Epithelioma of the Left Max. Sinus*) reports a case of a woman, fifty-nine years of age, presenting a tumor of the antrum as large as a hen's egg, the growth of which dated from an attack of erysipelas some time previously. The growth occluded the nostril and distended the left cheek. The submaxil-

lary and cervical glands were not enlarged. The patient was cachetic and had renal disease.

In this case, Verneuil used the thermo-cautery for the first time. The anterior wall of the sinus was found to be completely destroyed. The epithelioma occupied chiefly the anterior wall, and Verneuil thinks may have originated at the root of the molar, which protruded into the sinus, and was greatly changed.

The patient regained her strength, and suspicious granulations have since then been touched with chromic acid. He does not record any microscopical report.

De Gaetano[13] (*A Case of Epithelioma of the Antrum of Highmore*). The patient was a countryman of sixty years of age, with a good family history: no syphilis. Disease began in the left zygomatic region in June, 1891, and gradually increased. When seen, the left half of the face was slightly swollen; ulcer in the internal angle of the eye discharging pus mixed with blood. This ulcer communicated with antrum of Highmore. There was another ulcer discharging in the mouth. A piece of this latter ulcer was subjected to microscopical examination. It was fixed in Miller's fluid, etc. (The author gives details as to staining of cut sections.) The histological character of the removed tissue was that of a typical epithelioma. There was connective tissue of embryonal type, multiple infiltration of epithelial cells—some irregularly disposed, others united in groups of various sizes. In some of these groups the epithelial elements were rounded and regularly placed; in others, while the external cells had a cylindrical form, the internal ones were concentrically arranged, and on account of the pressure produced by the great number of the newly formed elements, were crushed and flattened. There was a central mass of detritus formed by the degeneration of the cells in the center of the nest. The condition of the vessels explained the epistaxis from which the patient had suffered. This is considered by Cornil and Ranvier as one of the principal symptoms of epithelioma of the antrum. The mucous glands were also affected by the epitheliomatous process, the lumen thereof being full of newly formed epithelial cells. This seems to me of great importance, since it is generally admitted that epitheliomata of this region originate in these glands, subsequently attacking the surrounding tissue. My observation confirms this opinion—at least, in part. To prove it conclusively I should have seen at least one gland in the beginning of this process at the moment when the epithelial hypergenesis began. That I did not do this is probably

due to the smallness of the section. I cannot admit that the process began in the superior maxilla, because Malassez and Anché have shown that primitive epithelioma of the bone does not exist, and this view is confirmed by Hannover and Thiersch. Thus, this neoplasm originated in the mucous glands, thence spread to the neighboring tissues, then invaded the maxillary bone, destroying its structure by a process of *osteitis rarefiens,* then opening to the internal angle of the eye with superficial ulceration of the skin, and opening also near the last molars, with ulceration of the oral mucous membrane. No operation was performed, since the submaxillary glands were already infiltrated with metastatic deposits and the orbit was very probably invaded by the neoplasm. The last clinical examination confirmed the diagnosis made five or six months before and recorded above.

Fink[14] (*Ueber Maligne Transformation Gutartiger Geschwülste der Highmorshöhle*) refers to several authors concerning the change of a benign to a malignant tumor, and then reports the case of a man, thirty-three years of age, who had had nasal obstruction since early youth, and when twelve years old was found to have nasal polypi. Obtained only temporary relief from their removal at the hands of two surgeons, and when about twenty years old Esmarch diagnosed a polypoid growth of the antrum, and advised the free opening of the cavity and the radical cure of the condition. This was declined. When seen by Fink there was a marked protusion of the right upper jaw. After about three years of increasing swelling and pain, and repeated removals of the polypi, he consented to removal of the jaw, and the growth was found to be carcinomatous. Death six weeks later from heart-failure.

Dunn's case[15] (*A Case of Carcinoma of the Antrum of Highmore; Nasal Polypi*) is described as one of double proliferating ethmoiditis, occlusion of the upper air-passages anteriorly on both sides by polypi, and hypertrophy of the middle turbinates. Deflection of septum from the left side. The inner wall of the left antrum was bulging; left cheek swollen. The tumor can be felt attached to the cheek-bone, just below the alveolar process. There is also a bulging into the mouth from about the line of the first bicuspid; it is not painful. Bistoury introduced met with little resistance until it reached the orbital plate. Nasal polypi had been removed at frequent intervals. Entire occlusion of the left nostril for the past month. The attempt was made to remove the walls of the antrum, but found tumor had spread so as to make

resection of the jaw useless. Antrum curetted and packed with iodoform gauze. Bleeding was excessive. Patient died of exhaustion about a year later.

A portion of the tumor, examined by Ward A. Holden, was pronounced to be carcinomatous.

Reinhard's[16] (*Ein Fall von Primärem Epithelial-Carcinom der Oberkieferhöhle*) would seem to be a well-authenticated case of primary epithelioma of the antrum.

The patient was a male, sixty-five years of age. Had had a purulent discharge from the nose. For five years he had suffered from left-sided nasal obstruction. The left upper teeth had become loose, and a sensation of pressure and pain in the left side of the head, which for a short time had prevented sleep. The purulent secretion from the nose was foul-smelling, and patient has lost twenty-three pounds in weight in the last six months. Nasal douches were used, but no other therapeutics. Six weeks previously the last molar tooth had been extracted, and now the foul-smelling secretion flowed directly into the mouth. Polypi were found in the left nares and removed with a snare. The patient had an appearance of suffering, but not of cachexia, and complained of the one-sided closure of the nose. The left cheek is somewhat swollen and painful on pressure. Pus is seen to flow from the ostium maxillare, and polyplike formations are also found in this locality. The hard plate on the left side feels somewhat soft, and yields to the pressure of the finger. A probe introduced into the antrum does not find a free space, but rather a soft yet solid obstruction. There was probably no glandular enlargement. A piece of tissue was taken from the opening in the alveolus, and also the polypoid swellings on the left middle turbinate. Both were examined microscopically, and that from the opening in the alveolus was pronounced epithelioma—the other was not. Upper jaw was resected, and the tumor was found to fill the entire antrum, and extended backward to the sphenoid, the pterygoid processes, and the base of the skull. Five weeks later there was no recurrence.

The details of Nicolai's[17] (*Case of Carcinoma of the Antrum of Highmore* ("Carcinoma dell' Antro d'Highmoro; sua Diffusione alla Cavita Nasale; Esportazione del Mascellare Superiore col Metodo Endo-Orale") I was not able to obtain.

A most interesting case of epithelioma in the antrum of Highmore in a horse has been reported by Saake-Wolfenbüttel,[18] detailing not only the history, but also giving the results of a care-

fully conducted post-mortem, together with a complete microscopical report.

The author was called in consultation, on account of suspicion of glanders. The horse had a large swelling in the region of the right antrum. In the center of the swelling was an opening leading into the antrum. The cavity was partly filled with soft tissue. There was a mucopurulent discharge from both nostrils. The third molar in the right superior maxilla was gone; the second and third loose. In the cavity left by the third molar was a blood-clot. The horse suffered from numerous hemorrhages, which made it anemic. A lymphatic gland in the right side of the neck was swollen and hard, but not tender. The lymphatic glands on the left side were not enlarged. The nasal mucous membrane, except for anemia, appeared normal. The horse was very weak and the appetite was poor. The owner of the animal was given no hope of its ultimate recovery and had the horse killed.

Post-mortem.—On opening the antrum, a greyish, seropurulent fluid spurted out. The antrum was filled with a tumor mass, which, in that part of the cavity nearest the orbit, was of the color and consistency of brain substance. In the lower part, especially in the region of the alveoli of the teeth, where it apparently originated, the tumor was greyish-white in color and of a firmer consistency. The thin lamellæ of bone which divide the cavity into separate compartments were destroyed. The lower turbinated bone, to which the tumor reached, was intact. The tumor was closely adherent to the surrounding tissues in the region of the second and third molar teeth, but was not adherent to the walls of the antrum cavity itself. The tumor had apparently grown from the alveoli into the antrum.

Under the microscope the tumor showed a fascicular structure of such a character that broad bands of connective tissue surrounded the microscopic field, which bands enclosed cells varying much in size and shape. The cells were, for the most part, rich in cell substance, and had bladder-shaped nuclei. Those cells which were in contact with the external boundary made by the connective-tissue strands (we presume the author means the connective tissue surrounding the nests) were of the shape of cylindrical epithelial cells with more or less longitudinal nuclei. Where the cells were grouped closely together the more internal had a polygonal shape, and the nuclei were not so easily stained. Now and then in the cell nests round bodies were seen, onionlike in

structure, resembling the "epithelial pearls." These enclosed a number of cells which stained deeply with hæmotoxylon and aniline colors. The tumor is classified from the above-described structure as an epithelioma. Since the epithelium of the antrum is ciliated, the microscopic examination makes it very probable that the tumor did not arise from the walls of the antrum, but, as intimated above, from the periosteum of the alveolar border, and that the antrum disease occurred secondarily.

This case seems clearly to indicate that the growth made its start in the region of the alveolar process.

A well-authenticated case of *Epithelioma of the Antrum* would seem worthy of presentation to the members of this Society, for their deliberation and discussion. It having been my privilege to operate upon such a case, something over a year ago, I take pleasure in detailing the history, which is as follows:

J. G., German, fifty-eight years, saloon-keeper. Came under treatment March 7, 1897. He is of heavy build, ruddy complexion, and full habit, weighing two hundred and fifteen pounds. Has always drunk beer and light wines and smoked a pipe. Six years ago he remembers having had pain in the region of the right antrum. The pain at that time was located in that region of the antrum nearest the nose. It has continued for three years, radiating in all directions, especially to the teeth, which have been always neglected. Several teeth in the right upper jaw were in a state of decay, and three years previously had been extracted. The pain, though not severe, had continued, and after one and a half years an opening in the antrum had been made through the alveolar process. There was but little discharge of pus or blood, and very little during the months that followed up to the time of operation. This opening had never closed. Four months ago he noticed a growth around this opening, which had rapidly increased in size. At the first examination there was found a large cauliflower-like excrescence projecting from the alveolar opening. It was about two inches long from before backward, and three-quarters of an inch broad. It appeared to be a large mass of quite dense granulation tissue, extending along the alveolar process of the upper jaw; but a more careful investigation revealed a pedicle, which extended into the antrum. While he had never had hemorrhages, the mass bled freely whenever touched with a probe; also when touched by his finger or when irritated by hard substances, such as bread-crusts. There was a sensation of fulness, with some pressure in the region of the antrum,

but no external swelling or bulging, and no severe pain. Transillumination revealed a dark area over the entire region of the antrum, especially underneath the eye of the affected side. There was no glandular enlargement. The nasal cavity upon that side was found to be quite normal, with no polypi, no apparent enlargement of the turbinates, no excessive secretion, and but slight congestion of the mucous membrane. The eye did not protrude, and was normal in every way. There was no family history of cancer, and he gave no history of having had syphilis.

Believing the growth to be made up of polypoid or granulation tissue, he was informed that an operation would be necessary for its removal. He was accordingly admitted to the Post-Graduate Hospital, March 5th, and the operation was performed the same day under ether. The large protruding mass was removed by the cold-wire snare, after which a probe was passed into the antrum, which was found to be completely filled with the same kind of tissue. The opening was enlarged by means of curettes and gouges until large enough to admit the finger. The next procedure was to remove the entire mass from the antrum by means of curettes. From the beginning the hemorrhage was excessive, but the patient being so vigorous and plethoric, it was thought to be safe to proceed without making any special effort to check it. Special pains were taken to curette every nook and cranny, and the very large opening made it quite possible for this to be accomplished. The absence of any extension of the growth into the adjacent tissues or sinuses, together with its apparent benign character, rendered further operation unnecessary. The cavity was thoroughly cleansed with bichloride solution and carefully packed with iodoform gauze. The patient made an uneventful recovery, without fever, pain, or sepsis. The packing was renewed once in two or three days, and the antrum cleansed with boracic acid solution. After about six weeks the packing was discontinued, and the wound allowed to close up.

A note entered on June 1st is as follows: "General condition good; opening is closing up, and there is no sign of recurrence. He complains slightly that the right cheek is a little swollen, and that it feels stiff, but careful scrutiny does not reveal any swelling anywhere. The patient is attending to his business as usual. From this date to March 14th, one year after operation, he has been examined once a month. There are now no visible signs of recurrence, no pain or tenderness, nor glandular enlargement, and no loss of appetite or flesh. His weight is two hundred and eigh-

teen pounds, a little more than before the operation, and his complexion is as ruddy as ever. Transillumination still shows a dark area underneath the right eye, and he still complains that there is a slight sensation of stiffness all over the malar region. The opening into the antrum is still entirely closed, and the whole appearance is healthy in every way. The eyesight is good. There is no fetid or purulent secretion."

Last note, May 10, 1898: "One year and two months after operation. He still shows no sign of recurrence."

The mass removed with the snare, together with several masses curetted from the interior of the antrum, were submitted to Dr. Jonathan Wright for microscopical examination, and to my great surprise it was found to be an epithelioma. That the growth was primarily from the antrum there could be no doubt. Its gross appearance was certainly unlike epithelioma, which, together with the fact that primary epithelioma of the antrum is almost unknown, had led to the diagnosis of a benign growth. Dr. T. M. Prudden also examined the slides, and entirely coincides with the views of Dr. Wright, and their report is as follows:

"536. Several pieces of the growth removed by Dr. Phillips from the maxillary antrum were submitted to me for microscopic examination. Sections were made through them all. The largest piece, irregularly ovoid in shape, and about the size of a small English walnut, was cut in such a way that the sections perpendicular to the surface extended through the whole growth. It was seen to consist throughout two-thirds of its extent of edematous tissue, characteristic of an ordinary edematous polypus of the nasal mucous membrane. At one extremity, apparently the distal cells, the epithelial cells are proliferated, and dip down with irregular outlines and outlying islands into loose edematous stroma. Whorls of cells with hyaline centers are seen well within the epithelial tissue, while nests of epithelium and isolated epithelial cells are seen infiltrating the stroma, so that there is no sharp line of definition between the two. From these appearances, I am strongly disposed to consider this growth as an edematous polyp at whose distal extremity a squamous-celled epithelioma has begun to develop.

"Recognizing, however, the doubtful reliability of the microscopic diagnosis in such a case, I have submitted a section to Dr. T. M. Prudden for examination, and, with his permission, I quote from his letter in regard to it. JONATHAN WRIGHT."

"I have looked at the specimen you sent me from the antrum

with a good deal of interest. I agree with you that the structure is wholly typical of epithelioma, and I certainly see no reason why a shallow epithelioma should not develop on the surface of a mucous polyp as well as anywhere else. The only thing, however, which would make me hesitate in a diagnosis which would involve an operation is the uncertainty of the direction of the section in reference to the surface of the underlying mass. If this section were cut obliquely or approximately parallel to a folded surface, one might get just such pictures as this with only a simple hyperplasia of the epithelium, provided the thing were

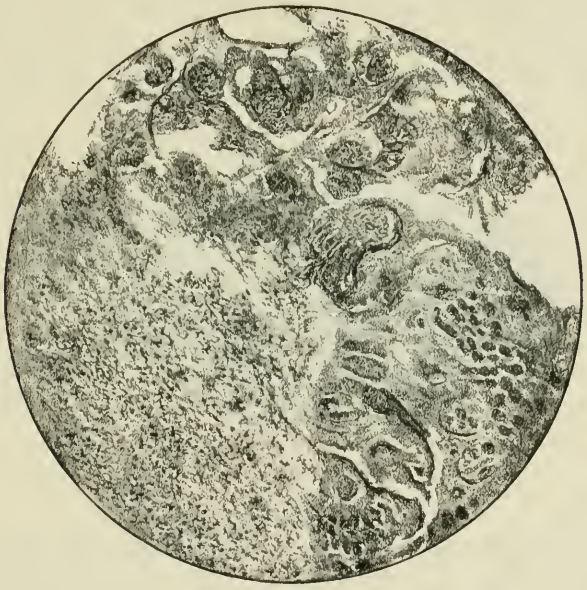


Fig. *A*.

growing in a straightened place, which would permit the epithelium to pile up. On the whole, my impression is that it is an epithelioma, but the diagnosis would be made with the above indicated reserve. T. M. PRUDDEN."

I have also had two camera-lucida drawings made, showing in the first, Fig. *A*, the region where the epithelial joins the edematous portion of the growth; and Fig. 2, a high-power drawing, showing the infiltration at one point of the epithelial cells into the edematous tissues. Dr. Wright has also sent a slide, so that any one who cares to do so can examine the specimen.

Conclusion.—That there has been no recurrence is probably due to the apparent incipiency of the growth enabling its thorough removal. The polypoid degeneration of the mucous lining of the antrum had no doubt existed for a long time. Had there been extension into the adjacent sinuses—especially the ethmoidal and sphenoidal regions—had the bony walls of the antrum become infiltrated or destroyed, or had there been extensive glandular enlargement, with a cachectic diathesis, the results would doubtless have been very different. By the thorough removal of the mass, however, it is hoped that all traces of the epithelioma have been obliterated. And the absence of recurrence after one year and two months have elapsed would seem to bear out this conclusion. The large opening, allowing such thorough curettement, is also believed to have contributed to the successful termination.

Fig. 2.

Large mucous polyps in the antrum of Highmore may become malignant. Early and thorough operation in all benign cases of antrum disease, both for the relief of the attendant affection and to prevent possible malignant developments, is to be recommended.

Under the circumstances, therefore, the microscopical report of the foregoing case would seem to indicate that the epithelioma had developed upon the surface of a mucous polyp.

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PAPER:

SARCOMA OF THE NASOPHARYNX, WITH REPORT OF A CASE.

BY D. A. HENGST, M.D.

The nasopharynx is not often affected by malignant disease; sarcoma seems to be met with more frequently than carcinoma, and of these medical literature contains the report of but a limited number of cases.

In the first volume of Dr. Bosworth's work on diseases of the nose and throat he gives a report of nineteen cases of sarcoma, located in the nasopharynx, all that he had been able to collect up to that time—1889.

Sarcoma is a disease of earlier life than carcinoma. Of Bosworth's nineteen cases, ten occurred between the ages of one and thirty years, and of the ten, five were between ten and twenty years of age. His cases were also more common among males than females in the proportion of almost one to three.

Symptoms.—The only symptom in the earlier stages which might make the symptoms differ from other tumors of the same region is the character of the secretion, which is of a sero-mucous character, and quite ichorous and offensive. This is quite an early symptom, and with the presence of a growth would of itself be almost diagnostic. Epistaxis, though slight, is liable to occur in many of the cases.

There is no special sarcomatous cachexia, but the general health suffers early in the history of the case; this is usually observed before there is any mechanical interference with respiration or deglutition. This impairment of the general health so early in the disease may be due to the offensive character of the discharge, which no doubt impairs digestion and poisons the inspired air. We all know that benign tumors of the nasopharynx, on account of interference with oxygenation of the blood, will greatly interfere with the general health, especially in young persons, among whom we find the majority of these growths. After the sarcomatous tumor has increased in size there will also be difficult deglutition and attacks of dyspnea.

Impaired hearing, by incroachment upon the Eustachian tube,

is also a prominent symptom, and there may be suppurative otitis media.

All the special senses except that of sight are usually impaired or abolished.

The origin of a sarcomatous growth is usually from the basilar process of the occipital bone, beginning in the deeper layers of the mucous membrane lining the nasopharynx, and growing in the form of lobulated rounded growth, and as it spreads downward closing the posterior nares, and forming attachments by infiltration in all directions. The tumor will assume an irregular rounded or lobulated shape, having a pinkish or somewhat muddy color, according to vascularity, between the somewhat translucent appearance of a myxoma and the pinkish-white opaque look of a fibroma.

The only positive way of making a diagnosis is the removal of a small section and making a microscopic examination of the same.

Carcinoma may be diagnosticated from sarcoma by the hard feeling of the former, which is quite different from the softer consistency of the latter. The question whether the tumor arises in the nasal cavity or the nasopharynx is not always an easy matter to decide; a nasopharyngeal growth, whether fibroma or sarcoma, is said to produce a unilateral, while a nasal growth gives rise to a bilateral stenosis, a point of some importance. Bosworth believes that the converse is true. In the case to be reported the former theory proved to be correct.

A nasal tumor is rarely attended with secondary infiltration of the cervical glands, or, if it is, not until late in the course of the disease. In nasopharyngeal cases, if it does occur at all, it will likely be earlier in its course. Enlargement of the cervical glands is said to occur in about one-third of the cases: in my case there was no involvement.

Sarcoma of the nasal cavities does not show a disposition to advance into the pharynx. It is said that a sarcomatous tumor, more or less filling the pharynx, is pretty clear evidence that it originated in the nasopharynx.

Prognosis.—The earlier in life the more rapid the course of a sarcoma; the character of the tumor also has something to do with the prognosis; a tumor composed of small round cells runs a much more rapid course than a spindle-celled growth; a fibrosarcoma, on account of the fibrous tissue, would not grow as rapidly as the others. In Bosworth's nineteen cases the patients, with one exception, all died either as a result of the operation or within a few

months from a rapid recurrence of the disease. In the other case the patient was alive seven years after the removal of the tumor with no symptoms of any recurrence. On general principles we may, therefore, regard the prognosis as exceedingly unfavorable.

Treatment.—The points in the treatment are the use of the cold wire snare, galvanocautery snare; slitting of the palate, or the external operation. Outside of the question of hemorrhage, which is not usually severe, my preference would be the cold wire snare, when there is no infiltration of the tumor with the sides of the pharynx, and when it can be encircled within the snare and used through the snares. In slitting the palate the growth may sometimes be encircled with a heavy snare or ecraseur, and after its removal the cut surface thoroughly cauterized, although there is some danger of exciting inflammatory reaction of a severe character in the surrounding healthy structure.

The external operation should only be performed when all other means are out of the question, and it gives any promise of prolonging the life of the patient, the patient being in a fair condition at the time of operation.

The following case, Jas. R., aged fourteen years, was admitted into my service at the Mercy Hospital on October 5, 1897, with the following history:

For the last two months he had difficulty in breathing through the right nostril, and somewhat less marked on left side; difficult and painful swallowing, headache, dullness of hearing, more marked on right than left side, an ichorous irritating discharge from the nostrils, slight epistaxis at times. There was no marked cachexia, but considerable emaciation, and no enlargement of the cervical glands. His father stated that he seemed to be in a sleepy state most of the time, and he complained of slight pain in the throat. On examination of the throat there was found to be a bulging forward of the right side of soft palate, presenting almost the appearance of an acute phlegmonous tonsillitis. The left side was not so markedly protruding, although not normal; on introduction of the finger into the nasopharynx, a semi-solid mass could be felt, almost completely filling the postnasal space; the posterior nares could not be felt, and the mass was completely attached to the walls of the pharynx and soft palate; only slight bleeding was caused by the examination.

There was not much doubt in my mind as to the nature of this growth. The question of its removal was next to be taken into consideration; to remove with the wire snare through the nose

was impossible on account of the infiltration with the surrounding tissues. To encircle the tumor with an ecraseur introduced through the mouth into the nasopharynx was also out of the question on account of adhesions all around.

On consultation with Dr. J. J. Buchanan, surgeon to the hospital, it was decided that the external operation was the only method offering any chances whatever, accordingly on October 10th, five days after admission, the operation was performed by Dr. Buchanan, in the following manner:

An incision was made transversely from the zygomatic process of the malar bone, skirting the lower border of the orbit to its inner and lower angle. It was then continued downward in the re-entering angle between the nose and cheek and along the upper lip to the middle line, where it was turned downward, dividing the lip at its middle. The soft parts, including the periosteum, were separated from the superior maxillary and malar bones at their junction.

A blunt hook was then passed around both bones at this point, and used to draw a wire saw beneath them. This saw was left in place. Another saw was passed under the nasal process of the superior maxilla and also left in place. A median incision to the bone was made in the roof of the mouth from the incisor teeth backward and the soft palate and uvula split in the middle line.

A drill hole was made well back in the middle line of the hard palate and a wire saw drawn through into the nostril alongside the septum.

The bones were sawn through in a few seconds with the three saws and the superior maxilla was lifted from its bed with a Ferguson's forceps and turned to the outer side where it hung out of the way attached to the face only by a pedicle of soft tissues. The infiltrating growth was cut away with scissors and required extensive dissection, it being impossible to remove it in its entirety.

The jaw was returned to place and held there by buried wire sutures. The soft parts, including the soft palate and uvula were sutured and but few signs of the operation remained.

The patient made a good recovery so far as the operation was concerned; the extensive wound healing promptly and showing very little scar, but in a short time the nasopharynx again filled up, and the patient died November 4th, twenty-five days after the operation.

Examination was made by Dr. Singley, pathologist to the hospital, and found to be a small round-celled sarcoma.

PAPER:

GUMMA OF PHARYNX AND RHEUMATIC PHARYNGITIS.

BY G. T. ROSS, M.D.

The close relationship existing between throat diseases and rheumatic affections is so frequently shown by clinical experience that many almost regard the conditions as those of cause and effect, yet positive evidence and precise data from a bacteriological standpoint being still lacking, I venture to place the facts of the following case before you, more as a short contribution to the clinical study of the relationship referred to than a consideration of pharyngitis proper.

Throat diseases of different character may precede or follow a rheumatic seizure, muscular or arthritic, or, on the other hand, diseases of tonsils, pharynx, etc., may manifest themselves in an individual of known rheumatic diathesis without the constitutional evidence declaring itself in any marked degree. Some writers claim to have established the germ theory of rheumatism and isolated the specific microbe, but validity of this claim is not generally accepted. If it be concluded that some cases of rheumatic fever arise from microbic infection, it does not follow that all cases are of similar origin. For if this disease be microbic we know that it can enter the system otherwise than by the throat, for instance, gonorrheal rheumatism occurs most often in subacute form, but sometimes it develops as acutely as ordinary rheumatic fever, from which it cannot be distinguished except by clinical history and the evident inutility of antirheumatic remedies. Again, painful swelling and redness of the joints may occur in typhoid fever as well as non-critical sweating, both notable features of rheumatic disease. Further, post-scarlatinal rheumatism cannot be distinguished from the ordinary disease except by its clinical history, and the microbic origin of scarlatina is hardly to be disputed. Typhoid and gonorrhea being certainly microbic and scarlatina about as certainly, then the presumption of rheumatic fever being microbic is surely strong.

The more frequent occurrence of tonsillitis with rheumatism has induced us to regard the tonsils as the specially offending

members in the elaboration of rheumatic poison, if we accept this theory.

A matter that has some bearing on this subject is the decision of the British Medical Association in 1896, as to the infectious character of tonsillitis. The following grounds sustained this decision, *viz:* (1) The clinical signs were those of infective disease. (2) Cases were noted where it had been transmitted from one to another. (3) Various cocci and bacilli were found within the lacunæ follicles, and even the epithelial cells of tonsils removed during the acute stage of tonsillitis, also leucocytes in large numbers associated with these germs. By-products are inseparable from the presence of such microbes and the abundant lymphatic tissue renders easy the absorption of these products, be they noxious or otherwise, while the effects of such absorption are soon manifest. These facts apply about as forcibly to inflammation of the pharynx as to that of the tonsil, for in the former also we often have lymphoid tissue in abundance. The following case illustrates the close connection between pharyngitis and rheumatism.

On February 1, 1899, Dr. A. B., whose previous health had always been of the best, began to notice symptoms of acute throat inflammation. Several slight attacks of coryza had troubled him during the winter, but now he realized that his condition of overfatigue and want of rest due to a prevailing epidemic of respiratory troubles and unusual pressure of professional work rendered him a fit subject for the onset of throat disease. On examination his pharynx showed a severe hyperemia of the mucous membrane, in which the secretion was suppressed and a general irritation and relaxation of oropharynx and tonsils. Dysphagia developed early, yet he continued at work very unwisely as the sequel showed. In three days the pain was continuous and intensified by swallowing, being specially referred to nasopharyngeal vault. The measures adopted for relief mitigated the symptoms to some extent only. Temperature for first four days ranged from 99° to 101° while the pulse was 88 to 100. On the fifth day pains in muscles of the back asserted themselves. Walking now became painful, especially in bending or stooping. On the sixth day patient went to bed, all symptoms becoming worse, and from this date for three weeks following he suffered with a general muscular rheumatic fever.

During the progress of the disease the symptoms specially important were sense of great oppression over heart area, pain in every movement of the diaphragm, and a pericardial friction mur-

mur, this latter being evident for three days only. Six weeks after taking to bed the patient was thought sufficiently convalescent to go South, but after traveling two days a relapse occurred, necessitating another week in bed. Distress from the pharyngitis did not subside until ten days after it begun, but it did not return at any time subsequently.

Here was a case where it might be reasonably asserted that the throat disease was simply the constitutional diathesis manifested locally before the onset of the general symptoms, but with the microbic theory in view: with the fact that no evidence of previous rheumatism was obtainable: that it did not declare itself until a week after the severe throat disease; and that the patient, being an intelligent man, carefully regarded his own case, with the result thus briefly narrated, the conclusion arrived at was distinctly that the disease originated in the throat.

GUMMA OF PHARYNX.

Syphilis of the pharynx may develop in any stage of the disease. The tertiary form, with which the following case has specially to deal, may attack the tissues very insidiously and often considerable damage is done before the patient is aware of the seriousness of the trouble. Gummata may cause little inconvenience and ulceration be comparatively painless. A case illustrating this very clearly occurred in my practice a few weeks ago. A young lady had ulceration of the soft palate, beginning at left side of uvula, and dissecting between the anterior and posterior mucous membranes to the depth of an inch before relief was sought. Yet other cases of this disease occur where painful deglution may be such as to interfere materially with general nutrition. In such cases the constitutional symptoms are aggravated and the health much deteriorated but often the general health is apparently good in extensive luetic lesions.

Gummata of the pharynx, without ulceration, are comparatively rare when the lesion has existed any length of time, and so I have thought the following case worth reporting.

A. B., aged 46, unmarried, entered the Western Hospital complaining of sore throat which had troubled him for three months, and for which he had received prolonged treatment. Swallowing was painful but not severe enough to prevent taking his food. Previous health was said to have been good, but those who knew him said he was too miserly to allow himself sufficient sustenance.

His body was poorly nourished. He denied syphilitic infection at any time. Examination externally gave no evidence of constitutional taint. Internally, the the oropharynx was hyperemic generally, tongue soft and very flabby so that a depressor which did not cover the entire surface sank into the middle without depressing edges. There was difficulty in obtaining a good view of pharynx and larynx, but under cocaine a tumor was seen located on right pharyngeal wall. It was oblong, the lower margin corresponding to margin of velum, extending an inch upwards by half an inch in breadth. The growth was raised from the surrounding mucous membrane at least an eighth of an inch. Its surface was hyperemic, but no foci of necrosis or evidence of impending ulceration were visible. On palpation it was indurated, resistant, and smooth. The larynx was in a catarrhal state but elsewhere examination was negative.

Excluding other forms of benign tumors which arise frequently from the lymphoid vestiges, as lymphomata, fibromata, or other innocent growths peculiar to the pharynx, this tumor was regarded by me as luetic, notwithstanding the negative history, and I determined to test it by antisyphilitic treatment. The result was very satisfactory, for what had resisted previous medication outside the hospital, yielded in a marked degree to drachm-doses of the iodides, and disappeared almost entirely in about ten days with simultaneous relief to all the symptoms. The patient has remained well since leaving hospital, now three months ago.

PAPER:

A STUDY OF THIRTY CASES OF ANTRAL EMPYEMA.

BY FREDERICK C. COBB, M.D.

The object of this paper is to study a series of cases of antral disease as to cause and treatment. The etiology is, of course, of the greatest interest, since upon it hinges the prospect of cure. The antrum has always been considered a most intractable cavity, and we find in cases cited during the last ten years that surgeons have made wide openings in it, and even removed the bony walls in order to bring the mucous membrane of the two sides in apposition to each other, and thus stop suppuration. From my experience in these cases, I believe that the antrum is one of the most readily healed of cavities, if the cause of suppuration is removed. This theory was invariably borne out in all cases due to dental causes. Even cavities which had suppurated for months healed in a few weeks with no other treatment than cleansing washes. One of the most surprising things to me has been the fact that teeth with diseased crowns but perfectly sound roots, as proved after extraction by the dentists, may give rise to antral empyema, since after their removal the disease promptly subsided. To this fact Grünwald alludes in his book "Die lehre von der Nasenhohlen Eiterungen." It is a practical point in the treatment of cases of dental origin to instruct the patient, where removal of a tooth is necessary, to bring to his physician the tooth after its extraction by the dentist, that he may see for himself that no root remains to keep up irritation. Where no tooth appears to be the cause of the empyema the X-ray will afford us valuable information as to the existence of old carious roots in the alveolus. I have seen two cases, one in which the dentist himself, after extracting a tooth, found some weeks later that he had left behind a small root, and another instance in which, although it gave no sign in the alveolus of its presence, such a root remained after extraction of the tooth by a dentist of good reputation. In spite of a long course of treatment the antrum failed to improve until on visiting a second dentist, while under treatment for another tooth, the former root was discovered and extracted, with immediate relief to the empyema. Such tooth roots will, I am

informed by the dentist, sometimes work their way downward and outward very much as any foreign body in the tissues, and finally cause a projection which can be felt or seen in or above the alveolar process. Two of the dental cases should perhaps be ranked under foreign bodies in the antrum rather than as purely dental cases, although their cause was plainly attributable to the teeth. These, I think, are of sufficient interest to be individually described.

Miss C. came to me in March, 1896, referred by a very good dentist, who had washed and treated the antrum for some time through an empty tooth-socket. The history she gave was of a severe cold, contracted about a year before, which had continued up to the present. On inquiry as to the teeth, it was learned that a second molar had given her pain at about the date of the beginning of her cold. The dentist had filled the tooth, and her nasal discharge, which was bilateral, but rather more marked on the corresponding side, began soon after this and lasted all summer. In the fall the tooth was extracted and the antrum washed through the empty tooth-socket by the dentist into whose hands she then came. The antrum, however, showed no signs of healing, and in March of the next year she was sent to me. A careful examination of the teeth failed to show any imperfect ones. The socket of the second molar was empty and communicated with the antrum. Pus was seen oozing from under the middle turbinated bone. The odor was foul and very offensive to the patient. No signs of ethmoiditis were found, and she improved rapidly on thorough flushing of the antrum with antiseptics, but at once relapsed when treatment was discontinued. Finally, she brought me a small piece of black, hard substance, which she had passed from the nose, and which on heating gave out the characteristic smell of rubber.

The only means of its introduction into the antrum was evidently through the dental cavity so long ago filled by the now extracted second molar. The rubber must have been injected in a melted condition and passed through an open dental canal into the antrum, solidifying as soon as cooled. The question now arose as to whether more rubber existed in the antrum, and the continuance of the symptoms rendering this probable, a larger opening was drilled in the alveolus, and the antrum was packed with gauze in the hope of entangling in its meshes some more pieces of rubber. The first attempt was unsuccessful, but on

second trial the gauze was found to contain several small pieces of rubber similar to that first found.

The symptoms at once began to improve and in a few weeks they subsided, except for a slight irritation caused by the wound. As soon as the opening in the alveolar process healed all symptoms subsided and the patient has remained perfectly well.

A second case, also dependent on dental conditions, is cited because it is unusual, and because it shows that a long-continued antral empyema may subside quickly even after a tedious suppuration. R. H. P. came to the Boston Dispensary complaining of a foul unilateral discharge from the right nostril. Transillumination showed darkness on the right side. Examination of the nose revealed pus in the middle meatus, apparently coming from under the middle turbinated bone. On examination of the teeth the absence of the first molar was noted, and from the jaw above it pus was seen to be oozing. A sinus containing necrosed bone was suspected, and a probe passed into the opening found its way into the antrum. As the probe seemed to encounter loose bone, the alveolus was opened as near this point as possible, and a foreign body extracted which lay between the alveolar process and the antrum. On removal of this a clear passage to the antrum remained, in size about the diameter of a slate-pencil.

This foreign body proved to be a twelve-year molar. As the boy was eighteen years of age and the discharge dated but three or four months back, the interesting question arises as to why the tooth lay so long encysted without having given rise to an empyema. The prompt subsidence of the discharge in this case is another proof of the tendency towards rapid healing of the antrum. In all other cases of carious teeth removal of the tooth was followed by prompt relief. The number of cases due to dental causes, including foreign bodies, was ten, or one-third of the whole number.

Seven cases were due to acute catarrhal conditions, and were characterized by severe rhinitis followed by discharge of mucopus from one side only. The antrum on transillumination showed dark on the corresponding side, while after the subsidence of the discharge it was again bright. An interesting point in this condition is the question whether or not the discharge in such cases is ever foul, as is the case in antral empyema due to bad teeth. In the seven cases mentioned it was not foul, although in one of them a bad taste was noticed. The average duration of these cases was three or four weeks. They required no treatment ex-

cept cleansing sprays and washes. In one case out of the seven the antrum was washed through an opening in the canine fossa, but this case seemed to subside no more rapidly than the others which were not opened. The question arises in acute inflammation of the antrum whether the disease is primary in that cavity or not. Of course, if the ethmoid cells, as I believe to be the case, often discharge their contents into the antrum through the infundibulum, then these cases may have been acute ethmoid or frontal inflammation. At all events, the antrum, after the process was over, transilluminated as well as that of the other side, showing that it no longer contained purulent material. Another interesting point is the cause of the darkness on transillumination. That this cannot be due simply to the presence of pus is evident from the fact that no change can be noted after thoroughly washing out the cavity. That it is due to thickening of the mucous membrane was proved by microscopical examination of a core of bone removed on trephining the antrum through the alveolar process. The mucous membrane can be seen in the preparation to be enormously thickened, but the cilia remain intact, showing that the process does not necessarily destroy its integrity. The specimen referred to was removed from a patient who had undergone suppuration for more than a year.

Syphilis is a cause always to be considered in questions of antral disease. Of the total number of cases cited, four were undoubtedly syphilitic, and were proved to be so by the immediate effect of antisyphilitic treatment. They have, unfortunately, passed out of our observation, but were nearly well when last seen. The discharge in such cases is usually very foul, and has the odor peculiar to the necrosing condition of bone, and sequestra from the walls of the antrum or from the lower turbinate are often discharged with the pus. Of the thirty cases only one was malignant. In this instance the antrum was opened through the alveolar process and curetted, but the hemorrhage was so profuse that suspicion of a malignant growth was entertained, and some of the fragments curetted off were submitted to the pathologist and a diagnosis of sarcoma was returned. The tendency of the opening into the antrum is to close under ordinary conditions, but in cases of malignant growths it tends rather to increase in size, and this enlargement should always awaken suspicion of a malignant process. Marked hemorrhage on curetting should always awaken suspicion of malignancy, as should also the presence of considerable pieces of tissue or bone in the discharge.

Ethmoid disease was associated with antral suppuration in seven cases. Most of these were rebellious to treatment, except where marked signs in the region of the middle turbinate were discovered. In one of these removal of the middle turbinate, which was enormously hypertrophied and polypoid, and carefully clearing out the ethmoid region, was followed by complete cure. The antrum became bright again and the discharge ceased without opening into the antral cavity. Microscopical examination of the bone showed the presence of osteoblasts and new-formed osteoid tissue. When this was removed all discharge ceased and the patient has remained perfectly well.

In another case the removal of the middle turbinate was followed by cure, but coincidently one or two teeth were removed, and although these were found to have apparently sound roots, yet they render dubious the effect of turbinotomy. The general conclusion with regard to these cases is that where ethmoid disease complicates antral empyema the prospect of cure of the antrum is dependent on the curability of the ethmoid lesion. In such cases my experience is that it is unnecessary to open the antrum, but that all the attention should be directed to the ethmoid. In obscure cases where antral empyema exists, but where ethmoid disease is doubtful, packing the antrum with gauze and observing whether the discharge ceases or not is a good means of diagnosis. If the pus discharged still continues almost as profuse as before, then the ethmoid region is probably affected, but if it ceases at once we are justified in concluding that the source of the trouble is in the antrum itself.

Of thirty cases only one was plainly due to nasal obstruction. In this instance there was a polypoid growth, on removal of which the discharge and all the symptoms promptly ceased. I have been impressed in the study of these cases with the very large part played by affections of the teeth, and believe that no physician should neglect to have an examination of them made by a competent dentist. If any doubt exists as to the presence of tooth roots in the alveolus the X-ray should be called upon to decide the question. In cases where ethmoiditis, as shown by a cleft in the middle turbinate, necrosed bone in this region, or any other signs of ethmoid disease exist in connection with antral empyema, the former should be treated as the probable cause of the latter.

Syphilis and malignant disease should always be considered as possible factors, and the interior of the nose and mouth should be carefully examined for signs of either. Finally, acute cases

not due to the teeth may and do get well without other treatment than cleansing washes, and this may be proved by the test of transillumination when used both before and after the subsidence of the symptoms.

PAPER:

CHRONIC INFLAMMATION OF THE PHARYNGEAL TONSIL, WITH LITTLE HYPERTROPHY.

BY CHARLES N. COX, M.D.

Since the attention of the profession was called to adenoid vegetations, or hypertrophy of the pharyngeal tonsil, by Wilhelm Meyer, the subject has received much consideration and has been the theme of numerous monographs.

It is now universally conceded by all who are best qualified to judge that lymphoid hypertrophy at the vault of the pharynx of sufficient degree to interfere with nasal respiration is productive of harm in several directions, the most important of which are:

1. General lack of development through insufficient aerization or oxidization of the blood, with its accompaniment of flat chest, etc.
2. Nasopharyngeal catarrh.
3. Aural disease.
4. Increased liability to infection.

These various effects, along with other minor ones, have been repeatedly brought forward and dwelt upon. The pathology and treatment of adenoid vegetations have been most elaborately discussed. It would seem impossible to present anything new on the subject.

In the typical case, where obstruction is a marked feature, there can be no question as to the expediency, or, in fact, the imperative necessity, of complete removal of the growth.

It is the purpose of this paper to present another class of cases, viz., those in which there is chronic inflammation of the pharyngeal tonsil or mass of lymphoid tissue at the vault of the pharynx, with little or no hypertrophy.

For a long time, I was little inclined to operate unless there was sufficient hypertrophy to interfere with nasal respiration. Lately, I have come to the conclusion that there are some cases of

chronic inflammation of the pharyngeal tonsil, with little hypertrophy, which require removal of that little to effect a cure of the evils attending the condition.

In such cases we find a very small collection of the adenoid tissue at the vault of the pharynx, obstructing little, if any, a perfect view of the choanæ. This mass is perhaps a little redder than normal, particularly if it has recently been the seat of an acute inflammation, to which it is frequently subject. It is usually covered, more or less, with thick mucus or muco-pus, varying in color from white to a greenish-yellow; perhaps streaks of this secretion may also be seen on the posterior wall.

The nasal cavities are usually quite free from secretion, except such as may find its way from the nasopharynx, and that takes place to a less extent than is the case with great hypertrophy of Luschka's tonsil. This affection is one of the most frequent causes of nasopharyngeal catarrh in children.

Patients with chronic inflammation of the pharyngeal tonsil are subject to frequent attacks of so-called "cold in the head." In many instances it is really not a coryza from which they are suffering, but an acute inflammation of the tonsil. During these exacerbations or acute attacks there is apt to be a certain degree of pain in the nasopharynx, which gives rise to more or less complaint of sore throat. During such an attack, the vault may be frequently dotted with small spots of exudation, as is seen in acute folliculous inflammation of the faucial tonsils.

Inasmuch as part of the chain of lymphoid glands which guards the upper part of the respiratory tract is disabled by disease in this affection, phagocytosis is enfeebled, thus permitting a more ready entrance into the system of pathogenic organisms. This probably accounts for the increased liability of such subjects to infection—and I mean by infection, not only that of the regularly classified zymotic diseases, but also that of less clearly recognized processes. For instance, I believe that condition known as a "cold" is more often the result of the entrance into the system of pathogenic organisms, carried into the air-tract by dust, than that of exposure to cold or damp air. In this connection, it is well to mention the frequency of so-called "bilious attacks" in children suffering from chronic inflammation of the pharyngeal tonsil; often in cases even where there is little hypertrophy. There is some close connection between these two conditions. To my mind, the malaise, chill, slight pyrexia, nausea, etc., point to a septic process, due to infection. This may be auto-infection, from

absoption of pus or muco-pus collected in the nasopharynx; or infection from without by means of dust-laden air. At any rate, the frequency with which such attacks occur in these subjects is worthy of remark.

Chronic inflammation of the pharyngeal tonsil is usually attended with more or less general debility and lack of tone. Anemia is a pronounced symptom in many cases.

During the acute attack of inflammation to which the diseased tonsil is especially disposed, the Eustachian tube and middle ear are frequently involved, and there results acute or subacute inflammation there. However, in my experience, the inflammatory process set up in the middle ear is generally of a subacute type, and does not often go on to suppuration as is so commonly the case when adenoid vegetations are present to such an extent as to cause considerable obstruction.

Finally, the conformation of the nasopharynx in some cases may be such that a small collection of hypertrophied lymphoid tissue will impair the resonating powers of that cavity to such a degree as to prevent the production of the finest quality of tone, which is of especial importance to the singer. The removal of this little hypertrophy is sometimes followed by the most gratifying results in patients who are professional singers.

Many of these cases of chronic inflammation of the pharyngeal tonsil will, of course, get well with simple local and general treatment. The administration of iodide of iron, or hydriodic acid is indicated. General hygiene and the life and surroundings of the patient should be looked after.

Local cleansing by sprays and applications of Mandl's solution, 5 to 10 grs. of iodine to the fluid ounce of glycerine are to be recommended.

While I do not wish to go on record as an advocate of the indiscriminate and reckless scraping out of every nasopharynx that presents itself, I do maintain that in certain cases of chronic inflammation of the pharyngeal tonsil, even where there is little hypertrophy, a removal of that little is the quickest and most efficacious method of treatment, and the one attended with the most lasting results.

DISCUSSION.

Dr. Howard Straight, Cleveland, Ohio: It is easy enough to decide as to the necessity for removal in the marked cases, and the authorities all agree that adenoids should be removed when they

obstruct; but I have been treating many cases in which the hypertrophy was slight for a number of years by radical operation and, in the majority of cases, I have secured good results. I do not want to go on record as favoring the indiscriminate scraping of the nasopharynx of every patient who comes under my charge. I know, of course, there are cases in which no operation is necessary; but I believe they are not nearly so common as many suppose. Curetting the cavity of the nasopharynx, like curetting the cavity of the uterus, is sometimes necessary. It is sometimes difficult to determine whether it is necessary to curette, and I have often been compelled to make a postnasal digital examination. If I find a much thickened membrane I curette rightly. I never found very much in the literature of the subject to bolster me up in my plan, except a slight reference in McBride, but the paper of Dr. Cox altogether justifies me in what I have been doing for a number of years.

Dr. Max Thorner, Cincinnati: I wish to say that I entirely agree with Dr. Cox and Dr. Straight. It seems to me that this question ought to be settled once for all. Not many years ago some of our text-books and monographs on the subject said that if there was a small amount of adenoid tissue, which does not cause obstruction, you need not remove it; and many operators were of the opinion that it was not absolutely necessary to remove at an operation every trace of adenoid tissue. The point which I wish to emphasize is this: it is not the amount of adenoid tissue which should be the guide as to whether or not an operation is necessary, but it is the disturbance which that adenoid growth may cause. This is particularly the case in people who must make professional use of their voices, as speakers and singers, and often in children where the reflex disturbance may be great, though the amount of lymphoid growth may be entirely out of proportion to the trouble caused by it.

Dr. Lewis C. Cline, Indianapolis, Ind.: I wish to congratulate Dr. Cox on his very interesting paper. I would like to ask him to explain a little further as to his method of operating. I think in all cases we should satisfy ourselves that we are going to do our patient good by operating before we decide to do so. The time for indiscriminate operating on every case is past. We all know some who operate on every patient, whether or not there is anything to operate upon. Of course, if we have something which is obstructing the nasal passage, we should generally remove it. I frequently remove adenoid growths by degrees, not using anesthesia, but a little cocaine, and then use the forceps and remove a small portion of the growth. I think I get as good results as those who use anesthesia and remove the entire growth at once; although, of course, I know there are cases where it is necessary to use anesthesia and remove the growth at one sitting; but the gradual method in private practice will produce just as satisfactory results. In curetting we should be very careful about scraping in too deep.

Dr. F. J. Quinlan, New York: I thoroughly disagree with the last speaker in making sectional operations. I think if we have a growth which interferes with respiration, the voice, or with the hearing, it should be removed at one operation in its entirety. I do not approve of the galvano-cautery in these cases. I was not here when Dr. Cox read his paper, so I do not know what stand he took on this question: but it seems to me that the use of the galvano-cautery is a dangerous measure; further, that it seems to me as non-surgical. I do not think there is anything more surgical than the knife, even if you do get a little bleeding occasionally. The worst case of hemorrhage I ever saw resulted from the use of the galvanic snare. It kept me busy all night and the following day. One other objection to sectional operations done without ether in children is that they terrify the child, causing it often to interfere with the movements of the operator.

Dr. Price Brown, Toronto: I agree with the last speaker. I think, if possible, the whole operation should be done at one sitting. I think this is particularly so in the case of children. In these cases, I often do the digital operation, using the finger only. It can be done very well in this manner. You can get a much better idea of the condition existing within the nasopharynx from the touch of the finger than when the impression has to pass through the curette. In older people, I have used the forceps, but have never found it a satisfactory instrument. I very much prefer the different modifications of Gottstein's curette. Still, even with this instrument, you can rarely complete an operation at a single sitting—a second being required several days later to render the removal thorough. I might mention one case I had in connection with this discussion. I removed almost the whole mass at one sitting. The patient was a prominent singer, and would not permit me to remove any more at that time. The result of the operation was some improvement, but she did not have a perfect voice. Finally, three years later, she came to me again, and I removed the rest. Her voice soon recovered, and it is now practically normal.

Dr. Jas. E. Logan, Kansas City: It has not been my privilege to see many cases of chronic hypertrophy in children. I thought the paper referred more especially to those cases found in adult life.

So far as the operation is concerned, I do not approve of the galvano-cautery. The curette is much better, and better still is the ring-knife of Schultz.

I think chronic hypertrophy in the adult is due largely, if not altogether, to diseased pharyngeal tonsil in the child.

Dr. Lewis C. Cline, Indianapolis, Ind.: Of course, I use anesthesia in some of my cases for the removal of adenoids. I use it whenever it is necessary. In the majority of cases, I do not use it. I do not see where the objection lies to taking off a part of the growth at one operation, and the balance at subsequent operations. I believe, with a little training and the right kind of forceps,

that better results can be produced in this manner, without danger of complications. It is my experience that parents submit more readily to the gradual operation. I have had very little trouble with children. Cocaine, in my experience, is all that is necessary. I have been criticized three or four times for doing the gradual operation, but I believe the doctors who criticized me most have never tried my method. I must insist that in many cases removal by the gradual method is preferable.

Dr. Robert C. Myles: I heartily indorse this prolonged discussion upon subjects of so much importance. There have been two very radical views expressed this afternoon, and we have listened to some diversified ideas as to the proper method of procedure. I think that both methods should be employed. I have had many cases in which Dr. Cline's method should be pursued for many reasons, and others in which a more radical procedure should be followed. If you will take the specimen shown by many operators as having been removed from a rhinopharynx, and put it under a microscope, very frequently you will find muscular tissue, fibrous tissue, and sometimes even periosteum. The tissue is not adenoid tissue. As a matter of fact, every case should be studied in itself. Some cases will require one operation, and some cases another. What is required is a scientific comprehension of the necessities of each case. There is no doubt in my mind that for the more extensive operations the use of an anesthetic is advisable. One important factor in these operations is to use a proper-sized curette, and a sharp one. Passing it well up until you strike the septum, and then carrying it backwards, while the attendant holds the head of the child in a straight position, one can often remove a very large amount of growth with one sweep of the curette. So far as ether is concerned in the operation of children, it has been my experience that the child dreads the ether more than the operation. Chloroform is preferable, but dangerous.

Dr. Cline: Do you use chloroform?

Dr. Myles: There is a strong objection to the use of chloroform in New York City.

Dr. Cline: Do you operate without anything?

Dr. Myles: Principally with crystals of cocaine.

Dr. Lewis C. Cline: I do not wish to take up much more time in the discussion of this question, but this discussion recalls one in which I took part. At the last meeting of the Mississippi Valley Medical Association I read a paper on this subject, and upon its conclusion several gentlemen proceeded to criticize the gradual method. After a heated discussion the participants were about equally divided in opinions. After the discussion, one of the gentlemen said to me that if the operation was on his own child he would not permit the radical operation, but in hospital work, where you wanted to get rid of your cases rapidly, that he would always remove the growth at one sitting. I think either in hospital or private practice we can get results by my method if we have

the right kind of an instrument and go about it in the right way. As D. Myles says, many children will submit to an operation, either with curette or forceps, rather than submit to anesthesia. That has been my experience.

Dr. CHAS. N. COX, Brooklyn, N. Y.: Mr. President, I have been very much interested in the discussion, although it got pretty far away from the subject of my paper, and for the benefit of some gentlemen who did not seem to understand just what my subject was, I will say that I took the liberty of changing the title to "Chronic Inflammation, with Little Hypertrophy." I am not prepared to dispute the statement of Dr. Logan that all of these cases must be the result of original disease in childhood. As to my methods of operating, I think, perhaps, the personal equation enters very largely into all operations. Some surgeons may be so skilful as to remove these slight hypertrophies with the forceps without anesthesia without causing a great deal of pain to the patient. I have sometimes, in adults, without anesthesia, removed the growth during several sittings. In children I never do. I always operate with anesthesia, usually chloroform, patient in horizontal position, using a Gottstein curette, or some modification thereof. In addition to that, I always pass my finger well in to see that I have completed the operation and not left any fragments or small portions.

PAPER:

REMARKS UPON SURGICAL TREATMENT OF CARIES IN NOSE AND EAR.

BY HENRY LEWIS WAGNER.

In caries of the bone we are often unable to eliminate surgically diseased organic and inorganic tissues, as we find them in syphilis and tuberculosis, fearing either to injure a vital organ, such as the brain, or to sever a neighboring blood-vessel.

In pathological chemical researches of caries tissue I have found that: (1) Through a microbotic process of fermentation the major part of the intercellular tissue is peptonized; (2) a substance similar to albumen, but not yet chemically defined, has also undergone a change, and (3) a part of insoluble lime salts has become soluble and apparently carried away by the lymph and blood. I, therefore, concluded and found that this caries-process could be arrested by application of heat, after thorough removal of the diseased parts: coagulating the organic tissues and also destroying the remaining micro-organisms; and especially the spores, which generally offer such resistance to all chemical disinfectants.

The heat enters the bone deeper and more quickly than any chemical, and the desired result is obtained instantly.

In making my tests I first tried hot air at 120° to 130° C., but I observed that it caused in some cases a secondary inflammation of the adjoining parts (arterial hyperemia). I overcame this obstacle by using a hot fluid vaseline spray, 120°, which produces no inflamamtion when carefully applied and allows leucocytes to migrate freely into the remaining diseased parts, which are then impregnated with serum and the fluid vaseline.

I have also made use of this hot oil spray in chronic sinus troubles where, after thorough removal of diseased tissue, it acts as an hemostatic and quickens the time of healing. After this procedure, which can be repeated, I use the dry gauze treatment.

PAPER:

ACUTE SUPPURATION OF THE MIDDLE EAR.

BY JAS. E. LOGAN, M.D.

Acute suppurative disease of the middle ear is not of common occurrence compared with the frequency of other types of active inflammation of this organ.

CAUSES.

The causes may be classified under two heads, as follows:

1. *General.*—Such as exposure to cold, climatic influences, etc.

2. *Specific.*—Such as exanthemata, typhus and typhoid fevers, pneumonia, diphtheria, influenza, operations in the nasal and post-nasal spaces, presence of foreign bodies in the tympanic cavity, douches, etc.

General causes act only indirectly in the production of this disease after the manner exerted in other affections of mucous-membrane-lined cavities, giving rise to what we understand as acute catarrhal inflammation. Sudden determination of blood to the part, turgescence of membrane causing obstruction to the ventilation and drainage, the accidental entrance of infected air, all conspire to produce the migration of pus-corpuscles

Specific causes act by the direct introduction of septic material through various channels to the middle ear. The purulent discharges found in the pharyngeal vault accompanying the exanthe-

mata, diphtheria, and the like, gain entrance through the Eustachian tubes. The blood-vessels may convey the virus of typhus or typhoid fever to this delicately lined cavity. Inflammatory processes existing in the labyrinth and about the base of the skull may extend to the tympanum.

Extensive research by competent pathologists fails to disclose the fact that micro-organisms are essential to the development of suppuration within the tympanum. Zaufal, Rohrer and others have spent much time in the isolation of a germ distinctive of this disease, and much interesting literature has been contributed by them. Zaufal found the following organisms in the pus from this cavity: Streptococcus pyogenes, pyogenes albus and aureus, cereus albus and tenuis, bacillus tenius, bacillus pyocyaneus, micrococcus tetragenus, saccharomyces albicans, diplococcus pneumonia and the bacillus pneumonia of Friedlander.

In no instance did he find one species operative alone, but the combined action of two or more served to maintain the suppurative process. Rohrer found the cocci alone existed in the non-fetid secretions, while bacilli were abundant in fetid discharges. He also suggests that the presence of streptococci indicates a severe form of inflammation, and a liability to mastoid involvement.

It is possible for pus to pass directly from the cranial cavity through some canal or opening between the bones into the middle ear, causing an inflammation, with perforation of the drum membrane. Gruber has been able to diagnosticate this condition, and has reported cases to prove his accuracy.

Kohn reports two cases of middle-ear suppuration during dentition. A number of cases are recited in which different foreign bodies acted as the specific causes. Fleischman found a barley-grain upon post-mortem examination in the Eustachian tube. Heckscher relates a case where a raven's feather was found fixed in the tube, producing inflammation. Schall reports a case in which he found a small piece of rubber syringe lodged in the Eustachian tube. The indiscriminate use of nasal douches, diving into salt water and such like practices are frequent causes of middle-ear suppuration. The forcible entrance of these fluids, and the lack of adequate drainage to this cavity, serve as ample cause of inflammation. Operations within the nasal and post-nasal spaces are sometimes followed by this disease, due to the entrance of infected material.

SYMPTOMS.

Deafness is usually the first noticeable symptom of this disease, followed closely by a deep-seated excruciating pain within the ear. An elevation of temperature ranging from 101° to 103° is manifest, which is in marked contrast to the slight fever of acute catarrhal conditions. Severe headaches are located about the affected side. Constipation is usually present, and the general appearance of the patient suggests marked constitutional disturbances. The symptoms are more pronounced in children than in adults. In the former, the attack is often ushered in by convulsions, while in the latter a severe inflammation frequently causes but comparatively slight discomfort.

Tinnitus is sometimes, though not always, present in early stages. Vertigo may, likewise, exist. The area of pain gradually increases and continues until natural or artificial measures for its relief are found. A temperature above 104° betokens a serious condition of the patient, leading one to suspect the involvement of brain structures, or a sinus invasion, or both. This severe complication would hardly show itself previous to a mastoid inflammation. A very rare occurrence is that of labyrinthine involvement, and the symptoms denoting this are dizziness and nausea, in addition to those already enumerated.

The physical signs are of greatest importance. At the very onset of the attack we may be able to get valuable information from the inspection of the drum membrane. We will find it to be of uniform scarlet-red or yellowish-red color. This is so intense as to destroy the outline of any blood-vessels upon its surface. The handle of the malleus is usually hidden from view, while the short process presents a whitish-yellow aspect. The membrana flaccida sometimes protrudes to the extent of touching the floor of the canal, excluding from view the membrana vibrans. Of course, this occurs only in those cases where the vault is the seat of the trouble. In some cases we may find small localized bulging areas presenting much the appearance of granulations; we are to infer that the discharges are confined to pockets made by adhesions, the remains of a pre-existing inflammation, or to folds of mucous membrane within the tympanum.

In some cases of sudden appearance such as follow measles, scarlet fever and the like, we may find the drum membrane in no way resembling the signs just given except in evidence of fluid. In other words, instead of a deeply reddened aspect we find a dull

grayish-white color, such as may be found in an old necrosing otitis. This is but a superficial epithelial necrosis, and can usually be made to disappear by applying the cotton pledget bathed in hydrogen peroxide.

TREATMENT.

Much difference of opinion exists in regard to the proper treatment of this disease. Some authorities insist that a conservative course gives the best results; while others of equal experience urge the employment of more radical measures. The conservative advocate the use of such means as will alleviate the suffering of the patient without resort to surgical interference; in other words, they advise against paracentesis, while the radicals urge the performance of this operation upon the first evidence of fluid.

All agree that abortive treatment should be vigorously carried on in the initial stage. This consists in local blood-letting by leeches in front of the tragus, by counter-irritation with blisters, the use of heat (sometimes cold), preferably dry heat, and the internal administration of laxative or purgative.

My experience urges the use of as much as half-grain doses of calomel every half hour until copious evacuation of the bowels is obtained. Injections of warm water into the ear from a fountain douche but slightly elevated is of much benefit in relieving pain. The internal adminstration of tinct. of aconite does much good in lessening the severity of the attack by controlling arterial tension. Acetanilid, phenacetine or antipyrine in 2½- to 5-grain doses to an adult every two hours will, in most cases, relieve pain.

Opium should not be given, if possible to avoid it, until the bowels have been evacuated thoroughly. This plan of treatment, if strictly carried out, will cut short many attacks, even though symptoms of a severe form show themselves; in cases dependent upon general causes its efficacy is particularly noticeable. I believe that in such cases we get the best results by adhering to a conservative course of action, for I cannot help thinking that early paracentesis, by opening the way for direct infection, here leads to the changing of a simple catarrhal condition to a suppurative process. Would it not be just as well, to say the least, to wait a few hours or a day, even though some evidence of fluid exists, in the hope that our already planned treatment may be of sufficient aid to Nature to lead to recovery? In most of these cases we lose

but little vantage ground by delaying until spontaneous rupture takes place, and in many instances this never occurs.

I can call to mind two cases occurring in my private practice within the last year in which I yielded to the wishes of the patients, and delayed opening the ear. Both recovered without rupture and with no unpleasant results, although in each instance there was distinct evidence of fluid, together with other symptoms more severe than would indicate simple catarrhal inflammation. Quite the reverse of this conservative procedure is, I believe, indicated in those cases dependent upon specific cause. When a case gives a distinct history of a malady such as would give origin to septic infection, I think that we are in duty bound to open the cavity, and allow escape of its contents; the quicker the better. In these cases spontaneous rupture subjects the patient not only to danger of great destruction of the drumhead and necrosis of the ossicular chain, but to the greatest of all complications, mastoid and cranial involvements.

Be careful in every instance to make a free opening—one that will not close up, and require a supplementary operation. The classical seat of this incision is in the posterior inferior quadrant, but it has always been my practice to open at the point of greatest bulging, and good drainage will usually be obtained. Thorough cleansing of the canal previous to this procedure is of greatest importance.

After drainage is well established, the duty of the surgeon lies in its proper maintenance, and in the employment of every means to insure strict cleanliness of the canal. Having accomplished this, his work is done so far as the ear is concerned. Continued application of dry heat will facilitate the discharge. Injections of tepid boracic-acid solution into the canal two or three times daily, followed by insufflation of the powdered acid, will preserve due cleanliness in most cases.

Inflammations of the nose or nasopharynx should receive proper attention. Applications of 20- to 30-grain solutions of silver nitrate to the orifices of the Eustachian tubes have proved valuable in my hands for the relief of tubal congestion. Granulations often appear about the perforation and in the canal after the first week of the discharge, and should be speedily removed. Trichloracetic acid serves an admirable purpose just here. I prefer it to chromic, for the reason that its action is more limited, yet sufficient to destroy the growths.

The greatest vigilance should be observed at this juncture

with reference to the mastoid. Upon the first appearance of deep-seated pain in this region, with tumefaction about the tip of the process and enlargement of cervical and postcervical glands, with sudden elevation of temperature, we should resort to the cold-water coil, used without stint, and to the administration of drugs for the control of the fever. In some cases I have found the use of the hot water bag, continuously applied, to be as efficacious as the cold: but when agreeable to the patient, cold is better. For the relief of the pain, which is always severe, nothing compares with opium. However, should constipation follow, due attention should be given to the bowels. The plan of treatment should be carefully adhered to until all symptoms disappear, or until their aggravation becomes so extreme as to leave no doubt of the involvement of the mastoid structures.

It is remarkably strange to see some of the most aggravated cases recover without operation. A very striking illustration of this occurred in my practice just a month ago. A young lady, 19 years of age, with incipient typhoid fever, was suddenly attacked with acute suppuration of the middle ear. Within a few hours after the appearance of pain, distinct bulging was manifest. Paracentesis relieved the distressing symptoms. The discharge continued for three weeks, apparently improving as the fever abated. Suddenly in the fourth week, there appeared all the symptoms of mastoid complication. Marked elevation of temperature; great pain extending from auricle to occiput; swelling in front and behind the process, destroying its outline; protrusion of the auricle; difficulty in opening the mouth. Extreme debility of the patient tended to an aggravation of all these symptoms. This change occurred on Wednesday afternoon of the fourth week of her illness. I proceeded to apply all the remedies at our command in a very vigorous manner. She protested against the use of cold, so the hot-water bag was applied in its stead. It was used hot to the point of endurance, and continued without cessation night or day until Monday morning. Two and a half grains of phenacetine were given every two hours, with an occasional dose of morphine. This was found sufficient to keep the patient fairly comfortable, and after the second day it controlled the temperature to a point below 101°.

Her symptoms, excepting the temperature, grew steadily worse, and on Sunday it was agreed, after consultation, that I should operate on Monday morning. I would have operated on that day (Sunday) had her temperature not been normal, or

nearly so. The hot-water bag and phenacetine were continued, and upon my visit Monday I found a decided improvement in every particular. My patient grew rapidly better, and at the time of this writing she is perfectly free from both typhoid and ear disease. Her hearing in the affected ear is 40/40, her only discomfort being slight tinnitus, which is rapidly disappearing.

This was a case of undoubted periostitis confined to the process, but many symptoms were sufficiently severe to indicate cell inflammation. Delays are often dangerous, and a nice point sometimes it is to differentiate between a severe inflammation of the periosteum and a deeper structural invasion. The points of difference are sometimes hard to define, but they do exist, and he is most successful who exercises good judgment at this crucial stage.

One thing in addition with reference to the treatment of this and other acute middle-ear diseases, and that regards the use of politzerization, or catheterization in the active stages of inflammation. I fail to see any benefit to be derived from use of force to evacuate the contents of diseased cavities like these. The material is soon reproduced, and to be effective it should be again quickly expelled. On the other hand, it is altogether possible to force these discharges into the antrum or cells of the mastoid, there to act as excitants of active inflammatory processes. I can recall two cases of mastoid disease that gave no signs of existence until after inflation. I had used every precaution to admit of free evacuation through the drum-head; used as little force as possible to accomplish my purpose, and yet closely following this came the unfavorable symptoms.

My inferences may be wrongly drawn, but my results are more satisfactory when I refrain from inflation until all appearance of active inflammation and discharges has ceased.

DISCUSSION.

Dr. Sargent F. Snow, Syracuse, N. Y.: I feel that Dr. Logan's paper contains too many observations to let it pass without notice. Perhaps I can best emphasize a few of its points by relating a case that occurred in my own family during the past winter. The patient had epidemic influenza, first attacking the system in a general way, later a fresh cold developing an acute rhinitis and an ethmoidal collection of pus, followed by invasion of the ear so rapid that we had no suspicion of its severity, until there was a rupture of the drumhead. During the early part of the trouble, I called in a general practitioner to attend the case, and he, at one of his visits, gave an opiate, with-

out any knowledge; this so dulled the pain that when the ear trouble was brought to my notice, I simply directed the nurse to give hot water injections, and went to my office. When I returned I found there was a hemorrhagic discharge from the ear and a bulging of the posterior-superior walls of the canal. This I incised at once, and evacuated a quantity of dark, thick blood. The opiate had so dulled the pain that I had no forewarning of the collection within the ear; next morning we had a mastoid tender, puffy, and giving great pain; temperature 102°. Ice-bags or cold-coil not being convenient, hot fomentations were applied, changing them every five to seven minutes. This was followed by marked benefit, but, in spite of the treatment, the mastoid remained tender, though we were able to control the pain. Dr. Halsted was called in consultation and concurred in the opinion that, although there was pus coming from the mastoid cells through the perforated drum, the local applications were acting so well that operative procedures could be deferred. It ran along nearly ten days, when another rhinitis started up, and we had an invasion of the frontal sinus. All the accessory sinuses of that side of the head were involved one after another, and the pus formation great, in spite of our best efforts. The hot fomentations undoubtedly did a great deal of good, but it was very hard work for the nurse, and we decided to put on the cold-coil. This also seemed to control the inflammation. If we kept it on, there was less discharge; if we took it off, the tenderness over mastoid returned and the discharge became more profuse. The cold-coil was kept on until the ear was healed, and it surely did control the mastoid inflammation. After catarrhal pneumonia, as a further complication, the patient finally recovered, drum healed, and aural functions were restored.

A nice form of applying hot fomentations is by the hot water appliance, recently devised, running a stream of hot water around the ear. In this manner you can keep the heat more uniform than in any other way of which I know. The ice-bag to my mind acts just as well as a cold-coil in controlling these inflammations, if you can get the nurse to put them on with no interval in the changes so as to prevent the blood-vessels becoming reëngorged.

One other point mentioned by Dr. Logan was that he believed many of these cases of mastoid inflammation were operated upon which could be cured without operation. My experience teaches me that this is so if we see the case reasonably early. In the cases that come to us late, it is not well to take too many chances, but even in those that are quite advanced, prompt and thorough local applications are of great service.

Dr. E. B. Dench, New York: I am very sorry that I did not hear Dr. Logan's paper. I have heard so much about it from Dr. Snow's remarks that I have an idea of the general character of the paper. There are one or two things in the remarks made by Dr. Snow with which I cannot agree. One is leaving the coil

on the mastoid for the length of time he suggested. I do not approve of leaving the coil on over forty-eight hours. If the coil is going to do any good at all in aborting the attack, it will be within that time. If the symptoms persist after forty-eight hours, you should certainly not delay opening the mastoid. I remember a case in which I tried the conservative plan of waiting. I used the coil for a couple of days. The patient apparently got well, left his bed, continued well, finally went to work, and then the trouble came back. I operated and found the mastoid full of pus. The tenderness may disappear, the perforation in the drum membrane may heal, but you may still have trouble in the mastoid. In another case which came under the observation of one of my colleagues, the physician attending left the coil on nearly four days (about seventy hours). The case developed thrombosis, and to my mind the treatment was responsible, partially, at least, for that clot. If you are going to use the coil, do not use it over forty-eight hours. The mastoid operation is practically devoid of danger.

Dr. T. H. Halsted, Syracuse, N. Y.: I am familiar with the case to which Dr. Snow has just referred, having seen the patient, a member of the Doctor's family, a number of times. When I first saw her she had a very profuse purulent discharge from the ear, very great mastoid tenderness and pain on deep pressure, especially over the antrum. The temperature varied from 100° to 102° F. She had had this otorrhea for about ten days, and moist heat had been applied constantly for this time. I thought there was a mastoid abscess, and believed an operation would be demanded unless improvement was soon shown. The Doctor was averse to the thought of this. I saw the patient probably eight times during the two months she was in bed, and at nearly every visit during the first six weeks felt that we were taking great chances in not operating, because there was every indication for operation. However, she made a good recovery without surgical interference. At the same time, I think very great chances of cerebral complications were taken, and my experience with this case, while it terminated favorably, would not incline me to treat another case like it, because I think the mastoid operation in itself is not to be feared, but the delay in operating is liable to result disastrously. My practice with the use of cold is to use it only in the beginning, and then with the ice-bag, from thirty-six to forty-six hours, and I have seen many times severe mastoid pain and inflammation subside under its use.

Dr. Charles W. Richardson, Washington, D. C.: I was very much interested in the paper of Dr. Logan and in the discussions which have taken place. I think several of the gentlemen have lost the main point that the Doctor brought out, and that is, the conservative treatment of these cases, and the Politzer's air-bag. The Doctor seems to wish to pursue a more conservative course in the early treatment of these acute cases than most of us think proper—that is, to delay paracentesis, let the membrane rup-

ture, and let the case continue of itself, with careful guidance. This course may be proper in some few cases, but in my experience it seems to me that there is no operation that does so much good as early paracentesis in acute suppurative otitis. I think if any gentleman would take a number of cases upon which paracentesis had been done, and a number of cases which had been left to follow their own course, he could not not but come to the conclusion that the paracentesis cases offer the greatest relief, the shortest period of convalescence, and the fewer complications. I think that you will all agree with me that the greatest number of mastoid and cerebral complications accompany those cases which are allowed to pursue this conservative course. In my experience I do not think I have ever done a mastoid operation in a case in which paracentesis was done early. They have been cases which have been allowed to follow the conservative course. Of course, I have not done so many mastoid operations as some of the older operators, and I would like to hear their experience in these cases. In a great many cases which are allowed to follow this conservative course, your patients are bound to suffer from twenty-four hours to four or five days—to suffer a great deal of pain—unless paracentesis is done. You can allay this pain to a certain extent by hot fomentations and by morphine. You can allay it almost immediately by paracentesis. I am certain that most of us can make a better perforation than Nature can, and the pain is relieved within three or four hours at the latest, and the case gets well in a week or ten days. By the conservative treatment, the disease will run from three or four to eight or ten weeks, with profuse discharge. Some time ago a man came to my office suffering with the most intense pain. He was shown into the back waiting-room, and I saw him at once. I did paracentesis and laid him on the sofa. I returned to my office to my practice, and when I looked into the room again he was sound asleep. This is usually the history of these cases where we do a paracentesis. Now, as to the use of the Politzer's air-bag, I am going to again differ with Dr. Logan. I believe the air-bag is sometimes harmful, but only in the hands of inexperienced operators. In those cases in which the amount of pressure is appropriate to the cases and in which the nasopharynx is cleaned out well before politzerization is resorted to, I believe the Politzer's air-bag often answers a useful therapeutic purpose.

Dr. Howard S. Straight, Cleveland, Ohio: In common with many men, I have not seen very much acute ear trouble, and this paper of Dr. Logan was very interesting to me. He is much less radical in his procedure than I would be. I have never made paracentesis and regretted it afterward. My method of treatment in acute cases is to send the patient home, put him to bed, and I think he should be kept in bed longer than is the usual custom. My plan is to use dry heat for a short time, a quart of salt in a flannel bag, red hot, put the patient to bed, and apply to the ear, and watch the case closely. You will find many cases

progress very well under this mode of treatment. As to the use of Politzer's air-bag in these cases; I believe it is the very last thing to do, and I cannot understand why the doctors recommend its use under such circumstances. I never use the air-bag after paracentesis, but believe that the ear should be kept perfectly quiet, and that the patient should be kept perfectly still in bed.

Dr. Lewis C. Cline, Indianapolis, Ind.: I believe that if many of these cases were more thoroughly and carefully looked into, that in many instances no operation would be performed, although, of course, in some cases, operation is imperative. I believe, with Dr. Richardson, that the whole thing lies in early recognizing the variety of the case, and that we should early establish perfect drainage. I generally clean out the nasal-passage by douching out the nose with warm salt water, and then give quite a good dose of Rochelle salts, or some saline cathartic, to thoroughly clean out the intestinal tract, in the early stages of these cases. I also like the remarks of the last gentleman, put the patient to bed and keep him there until the disease is thoroughly under control.

Dr. E. E. Holt, Portland, Me.: This is a very interesting paper and discussion, and one which the general practitioner should hear or read with a great deal of profit. I have noticed that several of the speakers have recommended the putting of their patients to bed early. It has been my experience that if patients were allowed to recline in a horizontal position, it made the inflammation of the ear worse. I think it is quite important to have the head raised at an angle of from 35 to 45 degrees, and inclined to the opposite side from the inflammation to allow drainage to take place as much as possible. One gentleman has stated that he finds it very difficult to tell the difference between acute catarrhal inflammation and acute suppurative inflammation. I think it is quite impossible until certain stages are reached. I have found one remedy very useful in these cases, and have used it when others were not at hand. I take a piece of cotton, spread it out, moisten it with spirits of camphor, or bay rum, and put in the center of it some capsicum—red pepper—which is always at hand. I wrap this up and place it in the ear, and it will almost invariably stop the pain at once. Then treat the patient with cathartics, and rest in the inclined position, and in this manner good results will be obtained in many cases of acute inflammation of the ear. Another remedy of great value in these cases is the glycerite of carbolic acid. I use the officinal preparation, and apply it warm on cotton freely. This invariably relieves pain at once. The parts become less congested and the case goes on to resolution.

In regard to paracentesis, I think no one, not even the writer of the paper, would question the advisability of doing it whenever there is bulging of the membrane, and imminent danger of bursting. I think much harm is done in these cases by many practitioners who practise douching and syringing. I do not think either after paracentesis or after rupture of the membrane that

the ear should be syringed indiscriminately. The dry treatment is by far the better method. I have seen cases during the past twenty years of mastoid diseases arising simply from syringing.

Dr. Holbrook Curtis, New York City, N. Y.: I am reminded by this discussion of a case I saw many years ago. I was called in consultation by a physician in the country. The patient was an Irishman, who had not passed his water for twenty-four hours. The Doctor said to me, "If this man does not pass his water within three days, I shall have to pass a catheter." [Laughter.] I said that I thought it was time to pass it now, and he asked me if I would kindly pass it. I think the thing to do in these cases is to do a paracentesis, and give the patient almost immediate relief. I do a paracentesis in the very early stages, and never have had occasion to regret doing it.

Dr. Price Brown, Toronto: I do not use any opiates in these cases, because a paracentesis gives almost immediate relief. As to other necessary treatment, I use the dry method, dusting with boracic acid, with doses of Rochelle salts internally. In all these cases, I think we should carefully guard our patients against taking cold.

Dr. Robert C. Myles, New York City, N. Y.: We are doubly indebted to Dr. Logan; first, for his paper, which is of great merit; and secondly, for the very interesting discussion to which it has given rise. In my experience with acute suppuration of the ear, we have two general classes or divisions, with considerable difference in the character of the infection. In a series of infections last winter, we found that one case in four would have no perforation, and the discharge would pass off into the throat. I think one of the chief indications for paracentesis is pain; for the simple reason that the pain is caused by tension, and, if this is kept up, there is sure to be more or less sloughing and invasion of the deeper structures. One point I would like to ask those who have had extensive experience, how, or by what process, do they render the external auditory canal aseptic? Beyond doubt, in my opinion, the best remedial agents we have in many of these cases are the saline cathartics and rest. In my opinion, injections of morphia, or soothing medicines, are dangerous. The authorities are a little indefinite, also, as to the cases in which invasion of pus into the cranial cavity is to be feared. I find by examining my records that by conservative methods of treatment I have cured over one hundred cases, which, according to the rule of some men, I should have operated upon; so that I have been cut out of one hundred or more mastoid operations, which I should have had if I had followed the indication for operation as set down in many text-books, but the patients got well, and I have lost just that many operations. I would like to ask some of these gentlemen, who operate so much on the mastoid, what is really the percentage of risk.

Dr. Edward B. Dench, New York City, N. Y.: I would like to speak of the failure to recognize the difference between an

acute catarrhal and an acute suppurative inflammation of the middle ear. I think the diagnosis can almost invariably be made. Suppurative inflammation of the middle ear begins in the upper part of the tympanum, and early in the disease the upper portion of the membrane is red, while the lower part is perfectly normal in color. In catarrhal inflammation, the membrane is uniformly injected. Now, as regards the paracentesis, I recently read an article in the *New York Journal*, written by a gentleman who has a great reputation as an otologist. He says that paracentesis is rarely necessary, and that there is really more danger in doing it than in doing a mastoid operation. I think this an utterly misleading and absurd statement.

So far as the catheter and air-bag are concerned, I can obtain better results in children with the use of the air-bag, but in older patients I prefer the catheter.

Dr. SARGENT F. SNOW, Syracuse, N. Y.: I wish to state that I thoroughly believe in early paracentesis. I think if we have a case that will not respond to hot fomentations or ice in a reasonable period of time it is better to do a mastoid operation; but if the temperature comes down and the tenderness is diminished, we are justified in waiting awhile. In the case I mentioned, the one in which continuous cold was used for a very long period, it was not because I had an acute, but rather a subacute, mastoid inflammation, with tenderness and a persistent discharge from the ear.

Dr. CHARLES W. RICHARDSON, Washington, D. C.: So far as mastoid operations are concerned, I have never operated on a case in which I had the slightest doubt about what condition I was going to find. The mastoid symptoms are so thoroughly understood that I can hardly see how any mistake in diagnosis could be made. Of course, I do not doubt that there are cases of mastoid abscesses which may get well without operation, just as there are cases of liver abscesses, but in mastoid abscesses where we have involvement of the mucosa, the walls of the osseous structures breaking down, we have a type of mastoid disease which can be relieved in only one way, that is, by doing a thorough mastoid operation; and I think the most conservative man would admit that these cases should be operated upon. So far as operations are concerned in the less serious type, an early operation will often save a great deal of suffering and may prevent future complications, and, if done by a skilful surgeon, is practically devoid of danger.

Dr. JAS. E. LOGAN, Kansas City: I am glad my paper has received such able discussion, and I appreciate the many points brought out by the gentlemen.

My paper does not discourage the use of paracentesis as some have misunderstood, but suggests the advisability of not opening the middle ear too hastily. The use of the knife in the earliest stages for the mere relief of pain, without evidence of fluid, does not seem to me the best procedure.

Again I thank you, gentlemen, for the very kind attention paid to my short paper and to the able discussion it received.

PAPER:

THREE CASES OF INTRACRANIAL ABSCESS: THE FIRST TWO CEREBELLAR AND FATAL (AUTOPSIES); THE THIRD SUBDURAL (RECOVERY); WITH REMARKS.

BY JAMES F. MC KERNON, M.D.

Case I.—Abscess of Cerebellum, Complicated by Thrombosis of the Lateral Sinus and Mastoiditis, Resulting from Suppurative Inflammation of the Middle Ear—Operation—Death.

As this case has already been reported in full in the "Transactions of the New York Eye and Ear Infirmary," for the year 1897, I will here give but a brief résumé, dwelling particularly upon those points which seem to me to be of special interest in this class of cases.

M. L., female, age seventeen years, native of the United States, applied at my service for treatment March 10, 1897, giving the following history: She stated there had been a discharge from both ears, at frequent intervals, for the past eleven years, particularly upon taking cold, and for the past four years she had sufferred from violent headaches on the right side, especially at the base of the skull.

Ten days before she presented herself at the clinic she had experienced a slight pain in the right ear, lasting for half a day, when the ear began to discharge and the pain ceased. For the next six days the right ear discharged freely, then the discharge lessened and the pain commenced again; this pain had lasted steadily for the past four days, with headache over the right side and pain behind the ear. Her temperature was 100.4°, pulse 108. Upon inspection of the ears, a slight watery discharge was seen coming from the canal of the right side. There was absence of the drum membrane, except a small portion in the posterior superior quadrant, which was bulging. A large amount of granulation tissue was present, and this was covered with gray-colored muco-pus. Pressure over the right mastoid caused considerable pain, especially over the upper third. The left ear showed nothing wrong in particular, except the remains of an old residual purulent inflammation, there being no tenderness on that side.

The patient was advised to enter the hospital, and have an

ice-coil applied, but this she refused to do. Incision was made in the remaining portion of the drum membrane and a few drops of pus were evacuated. Leeches were applied over the mastoid and she was given instructions to syringe the canal every three hours with a solution of bichloride, 1-3000, and report at the hospital the day following.

Two days later she returned, still suffering from pain in the right ear, over the right mastoid, and the right side of the head, the discharge now having almost entirely ceased. She now consented to remain in the hospital. An ice-coil was applied over the right mastoid, and irrigation of the canal was kept up with bichloride every three hours, and a calomel purge, followed by a saline, was given with good results. The coil was kept on until noon of the following day, when it was removed, and the slightest pressure over the mastoid caused the patient to cry out with pain. The discharge from the canal had entirely ceased, but she complained of very severe pain over the right side of the head. Her temperature was now 101.2°, pulse 102.

The *operation of opening the mastoid* was now advised and accepted, as she said she could not possibly bear any more pain. She was etherized and the usual mastoid incision made; upon retracting the soft tissues, the mastoid presented an irregular outline, rather narrow, with color white and glistening. The antrum was opened and found to contain a few drops of pus and a small mass of granulation tissue. The situation of the antrum was very high up, and in entering it a small chip of bone was removed above, exposing the middle fossa. Granulation tissue was also found in the tympanic cavity and removed with the curette. The mastoid throughout its whole extent was removed and found to be dense and hard as ivory; the pneumatic spaces were completely obliterated and filled in by dense bone tissue; the sinus was not exposed. The usual dressing was applied and the patient taken to the ward.

The next day the patient still complained of pain over the right side of the head and in the wound region; her temperature was 102°, pulse 114.

For the next four days she complained of headache on the right side and did not rest well at night, always saying that the pain was as bad as before the operation; during this time the temperature ranged from 99° to 102°, pulse never above 108 per minute.

On the 17th day, five days after the operation, the dressing was removed and the wound inspected. The mastoid area did not look

healthy, and there was a slight tendency to slough at the lower angle of the wound. The wound was cleansed and a dressing reapplied. That night the patient complained so much of pain in the wound and headache that it was necessary to give her an opiate, to get even an hour's rest.

The next day pain continued with a gradual rise in temperature to 104°, and Dr. Dench was asked to see her in consultation. The dressing was removed from the mastoid, which presented a grayish look over its entirety, and upon palpating with a probe softened bone tissue was found over the central portion of the lateral sinus; at one point, just below the center, the probe passed through this softened bone and entered the sinus, and upon being withdrawn was not followed by any flow of blood.

A second operation was decided upon, the patient etherized, and, with the assistance of Dr. Dench, the upper portion of the sinus was exposed for about one inch. The bone over it was very soft and carious, and the sinus was found collapsed; the dura over this upper portion was incised and a large amount of dark-colored pus and granulation tissue were removed, the curette was used freely, and circulation restored above. This was controlled by packing iodoform gauze against the sinus. The lower portion of the sinus was now uncovered as far as the jugular bulb. The bone covering this part was exceedingly thick, its cancellous structure being carious. The dura over this portion of the sinus was opened as far down as the bulb, and pus and granulation tissue similar to that found in the upper part were removed, the sinus was curetted, and a free hemorrhage took place from below, which was controlled by packing iodoform gauze firmly into the lumen of the vessel. It was noticed, while operating, that the posterior dural wall of the lower half of the sinus was somewhat thickened.

The patient rallied poorly from the ether and required active stimulation for four hours afterward. The next day she complained of severe headache, saying she could not possibly stand the pain; she vomited a yellowish fluid at four different times during the day. Her temperature was 103.5°, pulse 122. Upon the nurse's report that no urine had been passed that afternoon, the catheter was used, twelve ounces were drawn, and upon being examined was found to contain nearly 2 per cent. of albumen. At six o'clock that evening she became very restless, delirious, tried to get out of bed, and was unable to answer questions. Her temperature was now 105°, pulse 154, respiration 38. The dressing

was removed, and free hemorrhage took place from the sinus; this was controlled by packing with gauze as before.

The posterior dural wall of the lower half of the sinus, which was noticed thickened at the second operation, showed a slight fulness. The dura over this point was opened and a grooved director was introduced downward, backward into the cerebellum for about two inches, and, upon withdrawing it, was followed by a discharge of about an ounce of foul-smelling pus, together with disorganized brain tissue.

The opening into the cerebellum was now enlarged sufficiently to admit the finger, which, passed downward and inward, was followed by a still further discharge of pus of a very offensive odor. The cavity was sponged with gauze as gently as possible, packed loosely with iodoform gauze, and a dressing quickly applied; as the patient's condition was very weak, active stimulation with strychnia, digitalis, and whisky was needed to rally her.

After three hours she roused somewhat, and could speak, and took liquid beef peptonoids for nourishment at frequent intervals during the next six hours.

At three P.M. twelve ounces of urine were drawn, and upon examination showed a larger quantity of albumen present than the specimen examined eight hours previous. During the early part of the following day she was conscious and took nourishment, her temperature at no time since the evacuation of the abscess falling below 104°, with pulse 140.

Since the time that albumen was discovered in the urine, counter-irritation over the kidneys was used, followed by digitalis poultices, which were kept up continuously, and a diuretic was given internally.

At five P.M. the wound was dressed again and, upon removing the gauze from the abscess cavity, a brownish, purulent fluid escaped, together with more disorganized brain-tissue. The cavity was cleansed with small strips of sterile gauze, soaked in a normal salt solution, and loosely packed as before with iodoform gauze. During this dressing the patient complained of very little pain. For the next four hours she was conscious and said she felt better. Her pulse and respiration were better and she continued taking nourishment. The next morning she became very restless, and finally passed into complete coma. Saline solutions were retained by the rectum for a few hours. The poultices were continued over the kidneys, but no urine could be obtained by catheter, and she gradually became weaker. Active hypodermic

stimulation was used, and, at the end of three hours, four ounces of urine were drawn and found to contain a very large amount of albumen and many casts. Coma continued during the night and the patient died next morning at eleven o'clock. Just before death the temperature reached 107.4°.

Previous to the evacuation of the abscess, the eyes were examined by Dr. C. S. Bull, the result being negative.

Upon *autopsy*, no ante-mortem clot was found in any sinus of the dura, or any other intracranial involvement, except the two here mentioned.

I wish to call attention to the very dense and firm condition of the mastoid, the absence of pneumatic spaces, and the thickened condition in its entirety of the mastoid tissue. Bacon ("New York Eye and Ear Infirmary Reports," 1897) lays particular stress upon this point in his report of brain-abscess cases, saying that when the mastoid is found firm and dense upon operation and the symptoms still continue, he believes we are justified in further exploration of the cranial cavity, and that by so doing we shall many times discover the seat of the trouble, where otherwise it would be passed over.

Also attention is to be drawn to the fact of the bone being found carious over the sinus five days after the first operation, as this bone was dense, hard, and firm when first exposed, and infection must have come from within, working outward after the sinus became involved.

When a septic thrombus is present we should expect a chill and a sudden rise of temperature, with a spontaneous fall where septic material enters the sinus, but here the rise was gradual, and remained so until after the second operation. In this case, I believe that, primarily, the abscess of the cerebellum was the result of infection from the purulent inflammation existing in the middle ear, and was transmitted to the cerebellum through the medium of the pneumatic mastoid spaces and their venous communications previous to the mastoid becoming sclerosed, and that this focus of pus in the cerebellum was slow in its advancement, taking, in all probability, months or years (as would be safe to infer from the history of the case) to reach the state in which it was found.

Case II.—Abscess of Cerebellum, Complicating Chronic Purulent Otitis Media with Thrombosis of Lateral Sinus—Death from Chronic Nephritis.

W. J., aged twenty-five years, a native of the United States, by

trade an electrician, was admitted to my service at the New York Eye and Ear Infirmary, June 12, 1897, giving the following history:

He had been in poor health, though able to work, for the past two years. For several years past (no definite time could be remembered) he had been troubled with a discharge from both ears, with occasional attacks of pain. When the pain was most severe the discharge would be scanty or cease altogether, only to appear again when the ear broke and began running.

Two weeks before his admission, he said, there was a severe pain at night in the right ear, which lessened the next day when the ear began to discharge a thin white-colored fluid. For the next week he had pain in this ear occasionally at night. On the twelfth day after the pain began the discharge stopped, and was followed by a severe pain in the ear, and two days later the pain was felt behind the ear and had continued steady up to the time he was seen. He said for the past eight days he had had no sleep, not so much on account of the earache, because he was accustomed to that, but on account of a severe pain low down in the back of his head on the right side. This pain, he said, had continued uninterruptedly for eight days, and seemed to be getting worse each day.

Upon examination he was found markedly anemic and emaciated, having lost, he said, some twenty pounds in weight during the past four months. The skin appeared pallid, and he was very weak, being scarcely able to walk without assistance.

Upon inspection, a scanty discharge of gray pus, with a pronounced odor, was seen coming from the right external auditory canal. The superior and anterior walls of the canal were protruding into the lumen of the tube, shutting off a view of the parts beyond. Over the right mastoid was a boggy, edematous swelling, extending well down toward the tip. Upon the left side a profuse discharge of greenish pus was coming from the external auditory meatus. This was cleansed away. An inspection of the deeper structures showed absence of the drum membrane, and a probe, passed directly along the posterior and inner walls of the tympanum, encountered dead bone in several places. There was no mastoid tenderness on this side. The temperature was taken and found to be only 98.2° F.

The patient was informed of his serious condition and advised to have an operation at once. He readily consented, saying the pain was unbearable, and nothing could be worse than that. He

was sent to the ward to be prepared for the operation, an order being given to have a specimen of the urine examined before he was taken to the operating-room. This was done by the house surgeon, who reported, in a short time, that the specific gravity of the urine was 1010 and contained one-third of albumen by bulk. The patient was told of this kidney condition and the probable gravity of it, but he still insisted that something must be done to relieve the pain of the head.

He was taken to the operating-room, chloroform was administered, and the usual mastoid incision made, extending from the tip below, half an inch posterior to the attachment of the auricle, to a point corresponding to the upper border of the zygoma above. The incision extended through the soft part and periosteum down to the bone. The periosteum was easily separated from the bone, and this with the soft part was retracted, exposing a dark, mottled mastoid cortex. The bone was soft and necrosed throughout its entire external table. The antrum was easily entered and freed of a thick creamy pus. The mastoid cells were all broken down, and pus passed freely from one to the other. This formed a large cavity, filled with pus, decaying bone substance, and granulation tissue. All of this was thoroughly removed by the curette.

The necrotic bone extended well backward over the sigmoid sinus and down to the tip. All of this was thoroughly removed by the rongeur and curette, and in doing so one and a quarter inches of the lower portion of the sigmoid sinus was uncovered from the bend downward. A portion of the dural wall covering this part of the sinus was covered with granulation tissue. This was gently removed with the curette and thumb forceps. The uncovered portion of the sinus did not appear over-prominent, and no pulsation of the dural wall covering it was discovered when the finger was laid upon it. The sinus was aspirated and fluid blood drawn into the syringe, showing that the lumen of the vessel was free from any clot. A small tampon of iodoform gauze was placed over the point of aspiration, the surface cleansed, and the wound packed and dressed in the usual manner. The patient was returned to the ward, the time of the operation consuming forty-seven minutes. During the operation he was stimulated twice hypodermically, $^1/_{20}$ of a grain of the sulphate of strychnine being given each time. He rallied well from the operation, his pulse stronger now than before, but as soon as he became conscious, which was in half an hour after leaving the

operating-room, he began complaining of pain at the base of the skull on the right side of the head.

At eleven o'clock that night he slept for twenty minutes, and upon wakening was very restless and complained of nausea, but did not vomit. His temperature was now 102° F. Eight ounces of urine were drawn, and upon examination found to contain about the same quantity of albumen as the specimen previously examined. The microscopical examination showed it to contain abundance of hyaline and granular casts, with plenty of pus cells and epithelium. Hot packs and poultices were applied over the kidneys in the lumbar region, and rectal enemas of a warm, normal salt solution were used every three or four hours, and internally was given the infusion of digitalis, half an ounce every three hours.

The kidneys responded to this treatment, and he passed urine twice during the night and three times the following day, the smallest quantity passed at one time being three ounces and the largest nine ounces. These specimens all contained a large percentage of albumen.

The noon temperature, the day following the operation, registered 102.8° F., pulse 124. During the afternoon he was exceedingly restless, nauseated, and kept complaining of pain in the wound region and low down on the right side of the occiput. At five o'clock his temperature rose to 103.4° F., pulse 138 and weak, respirations down to 16 per minute and shallow. He seemed drowsy and no longer complained of pain. The eyes were examined, with negative result. The dressing over the wound was now removed, and that portion of the dural wall covering the exposed sinus was found bulging into the mastoid wound. The patient was stimulated with strychnine and whisky, and taken to the operating-room and chloroform again administered. The sinus was rapidly uncovered to the jugular bulb below, and above as far back as the torcular, and opened from end to end of this area, evacuating a quantity of pus, clotted blood, and granulation tissue. Free hemorrhage was established below, and was easily controlled by packing iodoform gauze into the bulb.

After persistent use of the curette and probe, the blood stream was established above, and let flow for a few seconds to wash away any septic material that might remain in the vessel. The hemorrhage here was controlled as below, by packing with iodoform gauze against but not into the lumen of the vessel.

After controlling the hemorrhage above and below from the sinus, it was noticed that the dura of the posterior sinal wall, corresponding to the lower half of the sinus, was bulging outward, similar to that of the sinus before it was opened. A slit in the dura, with a knife, at its most prominent part, was made, and a grooved director passed downward, backward, and inward into the right lobe of the cerebellum for about two inches, and upon being withdrawn was followed by a little oozing of foul-smelling pus. This opening was now enlarged with the finger, and was at once followed by a flow of about two ounces of pus, grayish in color, and with an exceedingly foul odor. This pus was quickly mopped out with strips of gauze soaked in a normal saline solution, and the cerebellar cavity loosely packed with iodoform gauze; a dressing was applied over the whole surface, and the patient quickly taken to the ward, placed in bed, and the foot of the bed elevated; active hypodermic stimulation of whisky and strychnine, and a warm saline enema in the rectum, were given, and the body surrounded by hot-water bags and hot bottles.

Under this treatment he regained consciousness, said he felt better and had no pain. His temperature was now, one hour after the second operation, 101.4° F., pulse 140, character weak. The time of the second operation was thirty-eight minutes.

At ten o'clock that evening he said he felt fairly comfortable, except a pain in his back and legs. His temperature was 102.3° F., pulse 148, still weak. The hot applications over the kidneys were renewed and kept up, and at 2 A.M. three ounces of urine were drawn, containing a still larger quantity of albumen by bulk than any of the previous specimens. During the morning hours of this day he took a small quantity of liquid nourishment, asked for water, was rational, and did not complain of any pain.

In the afternoon he became restless, somewhat irritable, and tried to get out of bed and go home. Later he became stupid, passed into a state of coma, and died at six o'clock that evening. Just a moment previous to the death, the nurse records that he had a slight convulsion.

I will not trespass upon your time by giving the full *autopsy* notes, except to say that no further evidence of any intracranial involvement was found. The kidneys were both in an advanced state of parenchymatous nephritis.

The features of particular interest to the writer in this case are:

1. The fact that the severe occipital pain was in no way relieved by the first operation, showing, as later events proved,

that the cause of this pain had not been removed, for after the second operation and the evacuation of the pus from the sinus and cerebellar cavity, when he regained consciousness, which he did in half an hour, he said all pain had disappeared, and while consciousness lasted he did not again complain of this pain, although asked repeatedly if it were present. This shows, I believe, that in the cases which are not relieved of pain by the opening of the mastoid we should go still farther, without too much delay, and explore the cranial cavity thoroughly in order to determine the cause, if possible, of the pain. In doing this, it can be accomplished with less injury to the cerebral substance, if, instead of using the aspirator, we use a grooved director; for, if pus be present and thick, it will pass through the ordinary aspirating needle used for this work. The director can be passed into the brain in several directions if necessary, and the slight hemorrhage resulting will do no harm, and if a pus-sac be found, even though thick, the pus will follow the director to the surface.

2. We expect in septic sinus thrombosis a rigor and a sudden rise of temperature, with remission. This did not occur here, as the temperature taken every two hours only showed an increase of scarcely one degree F., and this gradual in its rise. Also attention is to be drawn to the absence of any pulsation in the sinus when it was exposed at the first operation, as many writers have said when pulsation is not present the vessel contains a clot. I think this is of little or no value in determining the condition of the blood-current, as the pulsation when present, I believe, is due to the impulse transmitted to the sinus from the brain substance lying adjacent to it.

We are told by Starr (*N. Y. Eye and Ear Infirmary Reports*, 1897) that the symptoms of brain abscess can be quite distinctly divided into three stages. This may be true, but in brain abscess caused by a purulent otitis we may have complications, such as sinus thrombosis, meningeal inflammation, epidural abscess, etc., causing an increase in symptoms that are misleading; as, for instance, we look for a low temperature in abscess, but where pyemic sinus thrombosis exists we usually get a high temperature with a sudden remission, these being usually preceded by one or more rigors, so that the symptom of temperature cannot be relied upon. Again, it is much easier to diagnose an abscess of the brain, the result of traumatism, than middle-ear trouble. The indications justifying or calling for an exploration of the cranial cavity where

an abscess is suspected in relation to ear diseases are, I believe, as follows:

1. That a chronic otorrhea is, or has been, present.
2. Persistent headache, general and localized.
3. Restlessness and irritability of temper.
4. Tenderness of the affected side to percussion.
5. Nausea, vomiting, and vertigo.
6. An almost persistently low temperature.
7. A slow pulse, later stupor. Optic neuritis may or may not be present; when present, it may aid us very materially in arriving at a diagnosis, as may also aphasia and motor disturbances. In my own cases these were absent.

Of these symptoms, I believe the one to which the most importance should be attached is severe and persistent head-pain.

In 1895, Koerner reported ninety-two cases of brain abscess operated upon, with fifty-one recoveries. Since that time there have been a number of successful cases, both in this country and abroad, operated upon. He also says it occurs oftener on the right side than the left. The cases here reported would seem to bear this out, as all were on the right side.

The use of the chisel, gouge, and rongeur seems to me to be a more rapid method of entering the skull than the use of the trephine.

Case III.—Acute Mastoiditis, with Subdural Abscess Following an Attack of Acute Otitis Media—Operation—Recovery.

P. S., an Italian, aged thirty years, was admitted to my service at the New York Eye and Ear Infirmary, March 4, 1898, with history as follows:

Had always been in good health except an attack of the grip six years before, when he was sick for one week, but stated distinctly he had no aural trouble at that time, or previously.

Five weeks before, he contracted a severe cold and suffered from sore throat for two days. On the third day he experienced pain in the right ear, which lasted continuously for five days. During this period he was unable to sleep night or day, and the night of the fifth day, after a severe paroxysm of pain, the ear began to discharge and the pain was relieved. He said the discharge was thick, did not have any odor, and was very profuse.

Four days later the pain commenced again in the right ear, and two days after this, was followed by pain and tenderness over the mastoid of the right side. Pain was also very pro-

nounced over the right temple and radiated backward over the side of the head to the occiput.

During this entire period he was under the care of a physician who pursued the usual treatment in these cases, namely, syringing the ear, and later, leeching the mastoid, etc.

Upon physical examination there was a marked anemic condition present, with a characteristic septic pallor of the skin. The tongue was heavily furred and pulse about 100 per minute. A physician who accompanied him to the clinic said his temperature that morning was nearly 102° F.

Inspection of the ears showed a profuse purulent discharge, yellow in color, coming from the external auditory meatus of the right side. Upon placing a speculum in the meatus, the superior and posterior walls were seen collapsed and bulging into the canal. At the lower and anterior part of the drum membrane could be seen a mass looking like granulation tissue. The mastoid over its whole area was exquisitely tender upon pressure. This tenderness to pressure extended above the zygoma and also in front of the superior attachment of the auricle.

An operation was advised and accepted. The patient was prepared, ether administered, and the usual mastoid incision made, extending through the soft parts and periosteum to the bone. The periosteum and soft parts were retracted, showing the cortex dark in color and mottled in its appearance. The first stroke of the chisel over the antrum caused pus to well up in the opening. This pus was of a dark-gray color, with but little odor. The antrum was curetted, and the whole outer table, which was necrotic, was removed. The whole of the posterior canal wall was removed as well as the tip. In fact, the whole apophysis was easily separated from the inner table, leaving nothing below except the muscular tissue beneath the tip. The necrosed bone extended back beyond the sinus for nearly an inch, and the sinus was exposed for one and a half inches downward toward the bulb from its bend. Granulation tissue was removed from this area over the sinus. The whole of the cavity was cleansed and communication established with the middle ear through the aditus.

In using the probe to palpate for softened bone, it entered readily that portion of the bony wall separating the antrum from the middle cerebral fossa. This softened bone was removed with the curette over an area of nearly an inch, exposing the dura, which looked very much darker than normal.

The dura was opened at this point, a grooved director was passed upward and forward between the dura and brain in the middle fossa. Upon being withdrawn it was followed by a discharge of pus from beneath the dura. The opening was enlarged sufficiently to admit of the passage of the finger, and the cavity emptied of about four drachms of gray-colored pus, with but little odor.

The probe was passed in various directions, but encountered adhesions all around the abscess cavity, showing that nature had walled off the pus and prevented its spread.

There was still some softened bone found near the junction of the superior and posterior canal walls, and in removing this upward and forward, an opening was found through the vault of the tympanum, showing where perforation had taken place. A bent probe was easily passed from here directly into the subdural abscess cavity of the middle fossa.

The cavity was syringed with a solution of bichloride 1-10,000 and packed loosely with iodoform-gauze. A separate piece of gauze was passed into the tympanum at the point of perforation and the other end carried against the dural opening of the middle fossa.

As the dura over the sinus was dark in color and covered with granulation tissue, it was thought best to aspirate it, even though distinct pulsation was present. The needle drew fluid blood from the sinus twice, showing the current was normal within. There was quite an active hemorrhage where the second puncture of the needle was made, but it was controlled by packing gauze against it.

The usual dressing was applied and the patient taken to the ward. The operation lasted fifty-one minutes and he required stimulation three times. $^1/_{20}$ of a grain of strychnia was given hypodermically twice, and later a dram of whisky in the same manner. The patient rallied nicely from the operation, and at eight P.M. his temperature was 99°, pulse 104. Six hours later his temperature was 102°, but he said he felt comfortable and free from pain.

At eleven o'clock in the morning of the day following the operation he had a sudden chill and complained of severe headache, sore throat, and pain in the back of the neck and throughout the body, and his temperature rose to 103.2° F. The throat was examined, and he was found to be suffering from an acute follicular amygdalitis. This, under treatment, subsided in a few hours

and the temperature gradually became lower each day until, on the eighth day after operation, it touched normal.

The first dressing was removed seven days after the operation and the parts found healthy, save a stitch-hole abscess in the upper angle of the wound.

From this time on he was allowed to sit up each day. The wound was dressed every other day, and he was discharged from the ward service sixteen days from the date of operation, returning to the clinic three times a week for treatment.

The one principal point for emphasis in this case is—that here we have a very extensive mastoid involvement, together with a subdural accumulation of pus, the result of acute otitis media of only five weeks' standing.

DISCUSSION.

Dr. Edw. B. Dench, New York: I was very greatly pleased to have the privilege of listening to this paper, the more especially as I saw one of these cases. It seems to me that we can learn just as much from cases which die as from cases which get well. It is a mystery why there is so litle inclination to report fatal cases. All of us want to report cases which get well.

Dr. Max Thorner, Cincinnati: I agree fully with Dr. Dench. I think we can learn about as much from the fatal cases as from those that get well. My experience with brain abscesses is somewhat similar to Dr. McKernon's first case. The patient was a man, the son of a physician. He was brought, in a comatose condition, to the neurological service of the Cincinnati Hospital and transferred to my service. He had been a victim of chronic otorrhea for many years. There was a very offensive discharge from the right ear, and the probe introduced into the attic would touch rough bone. The flow of this most offensive purulent discharge from the attic was very copious, and as the diagnosis of an otitic abscess in the temporo-sphenoidal lobe was made, we could have little, if any, hope for recovery, even if an operation was performed. The father told us, if there were any hope at all, even a little hope, that we should operate. I made first the usual tympano-mastoid operation, and found the antrum full of pus and granulation. The tympanic cavity was likewise filled with granulations, the walls all over were carious, especially the tegmen tympani, and upon introducing a probe through an opening in the roof, offensive pus commenced to drop out. Each time I introduced the probe more pus would flow. In order to ascertain the exact location of the abscess, I trephined the skull, made an incision in the dura mater, and introduced an aspirating-needle in several directions, forward and backward, and found everywhere much pus mixed with brain matter. I now dilated the opening in

the tegmen tympani, so that I could introduce my small finger, after which several ounces of exceedingly foul, greenish pus, mixed with débris, escaped. After the wound had been dressed and the drainage-tube inserted, the patient seemed to be somewhat relieved of coma, and reacted slightly to external influences, but would not take food. He died about fourteen hours after operation. At the post-mortem, an almost incredibly large abscess-cavity, about the size of an orange, was found to have almost entirely taken the place of the temporo-sphenoidal lobe.

Another case of some interest is that of a colored boy, aged ten years, who gave a history of chronic right-sided otorrhea. His principal complaint was severe headache, especially in the forehead, which could not be relieved by anything; and a continuous dull pain in the left side of the neck, just below the left mastoid process. I made the ordinary mastoid operation, and found the antrum and attic full of granulations. Both cavities were thoroughly cleaned and all carious bone removed. There was no evidence of any brain complication. Patient improved after operation and the temperature fell for a day or two. The pain then returned in the frontal region, on both sides, as severe as ever, also the pain in left side of neck. Examination of the fundus showed a slight cloudiness of the disk. About ten days after the operation he suddenly became comatose, and before he could be subjected to another operation he died. To our greatest surprise we found two abscesses in the right cerebellum, one evidently eight to ten weeks old, and the other probably four weeks old. The most remarkable feature about this case was the fact that the pain was persistently located by the boy in the two frontal regions, and in the left side of the neck, in the region of the mastoid insertion of the sterno-cleido-mastoid muscle. It could not be discovered at the autopsy how the cerebellum had become involved, save for a small discoloration and adhesion of the dura mater, about the size of a dime, to the posterior surface of the pyramid of the temporal bone.

Dr. Robert C. Myles, New York: I might refer to a case reported a few years ago. The case is already on record, and I mention it simply because it is similar to the cases reported to-day. A mastoid operation was done. When the curette reached the upper wall of the attic, it crumpled away. A few ounces of pus were emptied and we found a large cavity in the middle lobe. The child recovered.

Dr. Robert Levy, Denver, Col.: We know that brain complications often accompany mastoid disease in spite of early operation. I have in mind three cases which occurred recently in my practice and the practice of a colleague. In two of these cases there was no evidence of previous ear trouble. Mastoid operations were performed promptly, but serious cerebral complications developed a purulent meningitis. During the operation we attempted to wash off the surface of the brain in order to remove the purulent exudate, but were entirely unsuccessful. In the post-

mortem, a very strong stream of water was played on the meningeal exudate without success.

Dr. CLINE, Indianapolis, Ind.: I would like to ask Dr. Thorner in the case of the double-brain abscess if there was any distinct sac.

Dr. THORNER: There was a distinct sac.

Dr. CLINE: Was there a sac in any of Dr. McKernon's cases?

Dr. MCKERNON: In my first case there was a sac, but not in the second and third.

Dr. CLINE: Was there a sac in the case of Dr. Myles?

Dr. MYLES: There was a cavity surrounded by adhesive tissue.

PAPER:

RECURRENT PAPILLOMA OF THE LARYNX. REPORTS OF TWO CASES IN WHICH ALCOHOL WAS USED IN THE TREATMENT.

BY T. H. HALSTED, M.D.

The two cases which I report are simple recurrent papilloma of the larynx, but appear to me sufficiently out of the ordinary run to be worthy of discussion here.

Case I.—Mrs. C., æt. 34, wife of a physician of this city, was seen by me for the first time in November, 1894, because of hoarseness. Prior to the beginning of this hoarseness, three years before, she had had a clear soprano voice, and was a member of one of the leading church choirs of this city. In October, 1891, she had a severe laryngitis, lasting six weeks, during which time she continued her choir work. At the end of this six weeks all symptoms of the laryngitis, excepting that of huskiness or hoarseness, had disappeared; but notwithstanding that the hoarseness persisted, she continued an active member of the choir for more than two years, a lack of clearness in the upper notes only being noticeable.

On examination of the larynx, a rather pale tumor, sessile, distinctly papillomatous, somewhat larger than a split pea, was seen on the middle third of the right vocal cord on its upper surface. The edge of the cord was not involved, but the neoplasm appeared to project slightly. The left cord and other parts of the larynx were normal. She was six months pregnant. The diagnosis was papilloma and the removal of the growth advised; but she would not consent to any operative measures during her

pregnancy, unless some other symptom than hoarseness should arise. She returned in two years, saying that, because of her pregnancy, and the care of the twins resulting from it, together with the illness and prolonged convalescence from typhoid fever of her husband, she had been satisfied to forget her papilloma, even though her voice was now reduced to a whisper. At this time, December 30, 1896, she was aphonic, there was no dyspnea, occasionally a dry paroxysmal cough, and her general health was unusually good. On laryngoscopy, the tumor was seen to have changed somewhat in the two years. It was of a purplish-red color, and covered the anterior two-thirds of the right cord, extending to the commissure and involving the upper as well as the under surface and edge of the cord. On abduction the left cord was free, but on phonation the growth obscured its anterior half.

The patient was now anxious to have the papilloma removed. The pharynx and larynx were anesthetized with a 20 per cent. solution of cocaine, and the introduction of McKenzie's forceps attempted; but immediately the forceps entered the mouth a spasm of the larynx ensued, and was repeated with each attempt. The cotton applicator or probe could be introduced into the larynx, and touch the vocal cords without much trouble and without causing a spasm, but not so the forceps—McKenzie's or Schroetter's By using the laryngeal probe for a few days the larynx became somewhat more tolerant, and under cocaine a piece of the growth, the size of a small pea, was removed. One week later three pieces were removed, leaving only a thickening along the surface of the cord. The voice was greatly improved, and she could speak aloud very much better than she had in some years. I had never before attempted, under cocaine, the introduction of any kind of instrument into the larynx that at all approached this one in irritability. The spasm of the glottis was not due to the contact of the forceps in the larynx, because it would occur on the approach of the forceps to the mouth, or at the mere thought of their approach. A metal or hard-rubber probe, a cotton swab or brush, could be introduced without difficulty, but Schroetter's, or any other, forceps meant, nine times in ten, a spasm of the glottis before the epiglottis was reached.

The patient said pain was never caused by any of the operations. After the early operations the tincture of the chloride of iron was applied to the cords, but at the end of ten days the papilloma was very much in evidence again, and with difficulty

was again removed. To lessen the faucial irritability, the tonsils, which were enlarged, were removed. During January and February there were as many as a dozen sittings, when I would remove sometimes one, sometimes several, pieces, at other times not any; but, on the whole, the growth was recurring with an increased rapidity, and she was no less intolerant of instrumentation. To lessen the general sensibility the bromides were given, and for a few days morphine, but unavailingly.

The larynx being fairly clear at the beginning of March, I determined to confine my further attention, for some time, at least, to applications and sprays, feeling that these various operations in such a highly intolerant throat were accomplishing no good and probably only stimulating it to a more rapid progress. Alcohol during the previous two months had been used for a few weeks, but not regularly and systematically as it was later. We tried the effect of a one-half of one per cent. solution of formalin, but it irritated the larynx, or rather was so uncomfortable that she could not stand it, and it was given up. Alumnol was then used, with a spray, several times a day, either at my office or by her husband at home. At the end of a month, during which time no attempts were made at operating, the tumor had increased very rapidly and now involved not only the right but the left cord, and a distinct one was sprouting from the left side of the interarytenoid fold. After three or four sittings of a few days' intermission almost all the growth was again removed; but within two weeks it was larger than ever, and with every prospect of soon so obstructing the larynx that, in addition to the aphonia, would be added serious dyspnea, which was already beginning to be present on exertion.

Her husband, Dr. C., had been for some time questioning the diagnosis of a benign papilloma, fearing the growth to be malignant, although the microscopical report, as made by Dr. W. H. May, was a simple papilloma.

Inasmuch as the growth was recurring faster than I could remove it, I advised the Doctor to have his wife consult Dr. Charles H. Knight of New York, hoping that he might succeed where I had failed.

She saw Dr. Knight the first of May. His diagnosis was papilloma and his treatment at first the removal with forceps, finding the same difficulty I had met with. As the growth recurred, he began the instillation of absolute alcohol, teaching one of the patient's friends how to drop the liquid into the larynx,

and had this done twice daily. On June 12, having had the patient under his care five or six weeks, he wrote me as follows:

"Early in the week I thought I should have to open the trachea, the growth seemed to be getting ahead of me so fast. But I have succeeded in cutting away some of it, and the shrinkage under absolute alcohol instillations has been so marked that there is now adequate breathing-space, and there has been no spasm since the middle of the week. She does not become more tolerant. I have tried cocaine in from ten to twenty-five per cent. solutions; bromides in small and large doses; and morphine, without overcoming the irritability. The moment the forceps approach the larynx, the glottis closes tightly, and a great deal of force has to be used. Then occurs a spasm of the larynx very terrifying, and sometimes exhausting. Dr. Delavan saw her yesterday, and thinks it is not safe to let her go about without a trachea-tube. The microscopic report is simple papilloma."

The same treatment was continued, the dyspnea being continuous and the paroxysms frequent and alarming, until the latter part of June, when for the first time she felt a decided change for the better.

The patient was becoming very homesick, and on the 5th of July, having been away for ten weeks, she returned to Syracuse. Dr. Knight wrote me at this time the following:

"Mrs. C. went home on Friday. She would have been obliged to stay here two or three months longer, and we concluded it would be as well to carry out the present scheme under your supervision, and, of course, with your approval. I have never seen papillomata sprout as hers did, and I have never handled a more sensitive throat. In spite of all I could do, the neoplasm gained on me, and, I think I wrote you, at one time I thought the trachea must be opened. My plan was to continue the alcohol and use the forceps every other day, or as often as the condition of the parts seemed to warrant it."

The patient was aphonic and the breathing labored during ordinary respiration. On examining the larynx it was found almost filled with the neoplasm, neither of the cords could be seen, and there seemingly was much more of the growth than there had been ten weeks before. Under cocaine, at this visit, I removed as much as half a teaspoonful of the mass. The alcoholic instillations were continued, as Dr. Knight had begun them, using them three times a day. She returned in a couple of days, and it was gratifying to see that the opening made the visit before

was no smaller, but, if anything, larger. More was removed; and this was done twice a week for three weeks, at the end of which time the larynx was entirely clear, excepting for a small piece the size of a pinhead at the posterior ends of both cords. At no time between visits and operations was there any renewal of the papilloma. During July I removed as much as would fill a two-dram vial.

On August 1 I left on my vacation, and have not had occasion to do other than inspect the throat since. The alcohol was continued for two months. She had not been to see me for six months, not, in fact, until two weeks ago, when she came, at my request, for inspection. Her voice is steadily growing stronger and clearer, though still somewhat rough; and she occasionally indulges in singing, against my advice, however.

There still remain the slight thickenings at the posterior ends of the cords; but, considering her irritable throat, am content to leave them alone, and not risk lighting up a possible fire—not, at least, until an increase of the thickening should seem to warrant it.

My next case will be reported much more briefly, though its termination is not so happy.

Case II.—Florence Green, aged three years, residing in a neighboring town, was brought to me on April 30, 1896, because of supposed asthma. Breathing was very labored and loud. Both inspiration and expiration impeded. Suprasternal and epigastric recession during ordinary respiration. At times, especially at night, paroxysmal dyspnea caused cyanosis and alarming suffocation. Voice aphonic. The child looked tired and worn through the effort of breathing.

History.—She had been perfectly well until five months before, when hoarseness and difficult breathing, at first paroxysmal, began and have since steadily increased until the voice has become aphonic and dyspnea constant. On examination with the laryngoscope a pale-pink mass was seen to almost fill the lumen of the larynx, obscuring the vocal cords. The tumor was papillomatous, and apparently originating from the left side, though exact site could not be determined.

A diagnosis of papilloma of the larynx was made, and the father urged to leave the child at the hospital, where tracheotomy could be done, should it become a necessity. He took the child home, however; but, as the symptoms were all progressing and becoming very alarming, he brought her back at the end of two

weeks, and placed her under my care at the Women's and Children's Hospital.

I attempted, by frequent laryngoscopic examinations, to accustom the child to the use of the mirror, and hoped to be able to introduce the forceps under cocaine, but, because of the age of the child (3 years), this was found to be not feasible, as she would not tolerate the use of any instrument other than the mirror in the throat.

The larynx was sprayed, or an attempt was made to spray it, with absolute alcohol daily; but by June 1st, two weeks from the time of her coming to the hospital, the dyspnea became so alarming that tracheotomy could not longer be delayed, and I made the operation. In the meantime Tiemann & Co. had made for me a small McKenzie forceps, and as soon as the tracheotomy was completed, I attempted, under anesthesia and the guidance of the mirror, the removal of the growth, but succeeded in removing only a small part of it in this way. Under guidance of the finger, however, a great deal of it was removed. Microscopic report was papilloma. She made a good recovery from the tracheotomy. The alcoholic spray was continued, though its use was imperfect, the child being unmanageable. The growth soon recurred, and was again removed as largely as could be. Quickly returning, operative treatment was desisted from, simple rest to the larynx afforded by the tracheal cannula being the only method of treatment resorted to for the next six months. During this time the mirror was frequently used, and the tumor was seen to remain about the same. At the end of another three months (nine months without operation) it had increased quite perceptibly, and under chloroform an attempt with a cold-wire snare was made, but unsuccessfully, and the forceps were used as before, enough to fill a dram-vial being taken away. The same thing was repeated in two weeks. In two months very little was to be seen, but the cannula could not be left out of the trachea for more than a few seconds. A month later it was again filling up, and alcohol was dropped into the larynx daily by the nurse, a curved pipette being used for the purpose. This was a year ago, and since that time it has been kept up more or less efficiently, less rather than more. During the past year she has been in good general health, but at no time has there been seen any material diminution in size of the papilloma, excepting that following immediately upon operation. I have operated under chloroform four times during the year, each time removing as much as a teaspoon-

ful of the warty growth. She has been examined with the mirror at intervals of a few weeks, and two weeks ago the growth was not only intralaryngeal, but extended outside, growing along the edge of the epiglottis, at the left side, forming a clump as large as and resembling a red raspberry. The larynx is completely filled, and on changing the trachea-tube it is seen in this opening.

What influence the alcohol has had in these cases is questionable. In the first case it would seem that it had a very decided effect in limiting the recurrence of the tumor, which had shown such a remarkable tendency to recur. It was Dr. Knight's opinion that within a few weeks of the thorough and systematic instillations of the alcohol he could see a decided shrinkage of the growth between his operations. When the patient came under my care the second time I was struck by the fact that between my operations there was no recurrence, as there had always been before when alcohol was not used. The forceps removed and the alcohol held the growth where the instruments left it. That appeared to be the effect. We know, however, that the history of papilloma shows it to be a very uncertain kind of tumor, about which to prognosticate what it will do. It may possibly disappear without treatment, or after removal there may be no tendency to recurrence; or, again, as in my first case, it may grow and recur with exceeding rapidity, and then suddenly cease this tendency to return after removal; and if, at the time of retrogression of the neoplasm, sprays or applications are being used locally, these are likely to receive the credit for the change and improvement, whereas the growth may have simply spent its energy. In the second case, there has been no manifest influence one way or the other. The growth is not diminishing; at the same time the age of the child has prevented the alcohol being used as thoroughly and efficiently as in the first case, although its use has been much longer.

This second case is reported at this time largely for the purpose of bringing out a discussion, not only as to the past treatment, but with reference to the future, and with particular reference to the advisability of thyrotomy. This latter I have been very loath to do, because of the nature of the neoplasm, its very probable recurrence following the operation, and, on the whole, the unfavorable reports following it, not only as to recurrence, but as to the effect upon the voice. At the same time, all intralaryngeal methods employed up to the present time have failed utterly.

DISCUSSION.

Dr. S. E. Solly, Colorado Springs, Col.: I have used absolute alcohol in cases of papilloma of the larynx with marked success. My colleague, Dr. Gildea, and myself have been using it with success for the last year. Thus far, the results have been very favorable. Of course, the cases of papilloma which I have had, have not been severe like those reported, but they have been tubercular in character, rather small and very troublesome, and very often these papilloma require surgical interference. The patients, themselves, can use the alcohol spray. I had one man use it more or less for a year, with marked effect in restraining the development of the papilloma.

Dr. John O. Roe, Rochester, N. Y.: I have used alcohol in some cases of papillary growths of the larynx with gratifying success. Recently I have been using nitrate of silver in connection with the alcohol and the two used together seem to produce a better result than either used alone.

In a case that I have recently had under observation, the effect of this method was very marked. The growth occupied the anterior two-thirds of both vocal cords, extending somewhat into the ventricles. I first removed the growths as thoroughly as possible with laryngeal forceps and then applied alcohol, 95 per cent., with a cotton applicator. A short time afterward I applied a solution of nitrate of silver, 80 grains to the ounce. This was repeated every third or fourth day until all the thickening of the cords and the portions of the growth that could not be well engaged in the forceps had disappeared.

The alcohol in these cases seems to have a marked effect in causing the growth to shrivel up and produces at the same time a blanching of the tissue; and also acts somewhat as a local anesthetic. The silver applied afterward increases these effects and destroys the growth without the irritation of the larynx that is produced when the silver is applied without the alcohol.

Dr. Chas. W. Richardson, Washington, D. C.: I think the Doctor will pardon me if I suggest that his paper would have been more clear if entitled, "*Recurrent* Papilloma of the Larynx." All papilloma do not recur, while others recur, and recur, and recur. I have had cases where, upon the first examination, I have found one or two little spots of papillomatous tissue, and after a week or two the papilloma is here, there, and everywhere. Such cases are very hard to manage. You may remove the growths until you have the larynx perfectly clear, no point that seems diseased, and the patient's voice almost perfectly clear; and in a few weeks the trouble is as bad as ever again. I have at the present time three cases. I have tried alcohol many times but without much benefit. I have tried lactic acid with benefit. I do not know whether the lactic acid did good or whether these cases improved of themselves. I rather think these cases are sometimes self-

limiting. They recur and recur, until they lose all tendency to recur, and cease. I have obtained very good results from the employment of lactic acid, but am not prepared to say that its use was merely coincident with the improvement, and not the cause of it. I tried alcohol in some of these cases with no good result, and I have tried it in other cases with apparent benefit. In the three cases which I now have under my observation there has been no recurrence. One was operated on last September, one about Christmas, and one last March.

Dr. Robert Levy, Denver, Col.: I have had a number of cases of papilloma of the larynx and have tried alcohol in the treatment, but have never been fortunate enough to remove the papilloma except by the intralaryngeal method, except in one case in an adult. However, in children, I have in mind five cases, three of which I have already reported, and two are still under observation. In four of these I used alcohol without any benefit. Upon two of them I performed tracheotomy and curetted the larynx. In some cases I use chromic acid or some caustic preparation in the same manner as you rub acetic acid on a corn, and place the larynx at rest. I cannot see the advantage of absolute alcohol in children. I must say that my success with it has been very limited.

Dr. F. H. Koyle, Hornellsville, N. Y.: I removed large, multiple papillomata from the larynx of a nine-year-old boy in 1896. I removed the growths several times by the endolaryngeal method. I then intubated him for some time with negative results. After a preliminary tracheotomy, a high laryngotomy was performed. The neoplasm proved too tough to be removed by the most vigorous curettage and was dissected out with the knife. It involved the entire larynx, including the vocal cords, which were necessarily removed with the neoplasm. The actual cautery was then applied to the entire denuded surface and the larynx packed with gauze. The boy made a good recovery and since that time has worn a tracheotomy tube. The parents declined further treatment, although a subsequent operation was advised, so I have not examined him for more than a year. I have seen him around the streets and he appears rugged. He speaks in a whisper, and one can easily distinguish what he says. He seems to suffer very little discomfort from the presence of the tube.

Dr. Curtis: Why was the actual cautery used?

Dr. Koyle: In order to destroy the submucosa, as well as the mucosa, and thus effectually prevent the return of the growth. A month after the operation, however, the growth was recurring. Since that time I have not examined him.

Dr. Curtis: It strikes me that it is unreasonable to do an operation in that way. I do not think this method a surgical one. It would have been more successful if he had done a thyrotomy.

Dr. James P. McKernon, New York: I have used alcohol in five cases, but with no favorable results whatever. All were adults who refused operation. Two of them have since been operated upon by the endolaryngeal method, with no recurrence

as yet in either of them. One of the other cases passed from under my observation. Two cases still refuse operation. I used the alcohol instillation very faithfully but with absolutely no favorable results in lessening the size of the papilloma. I think in the recurrent cases that a primary tracheotomy followed by a thyrotomy ought to be done in order that the growth may be thoroughly removed.

Dr. T. H. HALSTEAD, Syracuse, N. Y.: These cases which I report were, as Dr. Richardson says, recurrent. They were sessile, and originated from the whole surface of the larynx. I have used lactic acid, after operating, without, however, observing any result. In Dr. Doyle's case I should fear that the adhesions following the galvano-cautery would be as bad or worse than the disease. With reference to alcohol in these cases: In that of Mrs. C. it seemed to have a restraining influence, but it was the forceps that removed the growth. In that of the child, I have up to now seen no benefit from intralaryngeal operations, rest afforded by the tracheotomy, or alcoholic instillations. I was anxious to hear a discussion as to thyrotomy with curettement in this case.

PAPER:

REPORT OF TWO CASES OF THE SO-CALLED EUNUCHOID VOICE.

BY F. H. KOYLE, M.D.

Under this caption I desire to present a report of the only two cases of this peculiar abnormality occurring in my ten years of practice. Not until recently did I arrive at what I believe to be a correct conclusion regarding the pathology of this somewhat rare condition, which, owing to its resemblance to the type of voice found in young castrated males, has been referred to by Biaggi (before the Lambert Medical Association, May 30, 1896) and Makuen (Philadelphia Polyclinic, October 28, 1897), perhaps others, as "The So-called Eunuch's (or Eunuchoid) Voice." Since an extended search of treatises on the larynx, as well as journal publications, general and special, has resulted in a failure to discover any effort on the part of any writer to discuss the etiology and pathology of the subject under consideration, I am tempted to go into the details of my cases, with the hope that I shall be able to throw some light on this imperfectly understood condition.

Case I.—J. M., æt. 17, a well-nourished youth consulted me on March 9, 1895, for the relief of a remarkably high-pitched voice

which had caused him so much annoyance and chagrin that he had long since been compelled to isolate himself from youthful society, and to make frequent changes in his place of employment in order to escape the jeers of his companions. He could not recall any experience of acute disease or injury immediately before, during, or after puberty. He was not particularly subject to colds, and had not had an attack of *acute articular rheumatism*. He had taken lessons in vocal music for some time from a competent instructor, but with no improvement. Regarding the condition as a neurosis, pure and simple, and probably of sexual origin, I endeavored to locate the psychic and reflex factors in a perverted nerve-influence due to "solitaire."

Tracing the resulting pelvic irritation through the inferior hypogastric plexus to the solar plexus, and reflexly to the spinal cord and stomach; thence through the vagus to the spinal accessory and recurrent laryngeal nerves; and taking into consideration the fact that from the spinal accessory are derived the motor-fibers of the vagus which innervate the muscles of phonation, it would not seem impossible that there should be a physiological inhibition of the spinal accessory nerve, resulting in a partial loss of motor influence to some or all the nerves governing the phonating muscles. A pseudoparalysis might thus be induced, similar, let us assume, to unilateral paralysis of the recurrent laryngeal, in which the voice may be for a time high-pitched.

On the other hand, it was considered impossible that a purely mental process should have contributed to or caused this continued abnormal phonation, since incoördination from such causes, the condition of age and mental development being considered, would render that theory untenable.

We have but to remember that it is to the pelvis we must look for the causes of the changes in the female voice, not only during the functional activity incidental to the performance of physiological processes, but also during the progress of any of the pelvic diseases to which the human female is so especially prone. A slight change in the voice has been occasionally noticed as a result of castration in the female, but the change is especially marked in the male voice, the degree being dependent upon the age at which emasculation took place.

My efforts to bring about a "confession" being unavailing, I set aside my theory for the time being and proceeded to make an examination of the patient. The nose showed considerable hypertrophy of the left inferior turbinate body; the nasopharynx was

normal; there was no excess of lymphoid tissue, and there were no lingual varices. The epiglottis and arytenoids were found to be in their proper axial relation to the other structures, while the mucous membrane throughout was free from congestion. The vocal cords were abducted, not as in gentle, but as in deep breathing, the left cord showing the greater degree of abduction and occupying almost the cadaveric position. Instead of being elliptical, the edges were somewhat convex, the right cord appearing to be thinner than its fellow and more congested. On an attempt to phonate the *right arytenoid alone* responded, while the *right cord* was seen to rise posteriorly, and adduct not only *to* the median line, but *past it,* and *in front of* its fellow, which remained close to the larynx in *incomplete* "extreme abduction." At the same time there occurred a slight lateral rotation of the larynx from right to left, coincident with the ascent of its right side, and requiring a different alignment of the mirror to avoid a deceptive laryngoscopic image. The expiratory blast caused a loose, flabby vibration of the left cord until the approximation was complete, when the resultant tone showed the characteristic falsetto for which the patient sought relief.

The endolaryngeal conditions obtaining in Case II, observed two and a half years subsequently, were essentially the same; but in this case there were found a large, sharp spur with its projecting edge buried in, and adherent to, the left inferior turbinate body; hypertrophy of the faucial tonsils and lymphoid enlargement of the papillæ at the base of the tongue. Being unwilling to abandon my theory of psychic and reflex phenomena, the case was regarded as a laryngeal neurosis in spite of the objective appearance to which I have referred. Accordingly, the patient was assured that his vocal apparatus was absolutely normal and that he had simply not discovered the "trick" of altering the configuration of his larynx at will. He was then directed to imitate the operator's voice in the use of low tones. In order to give him confidence, but not suspecting the wisdom of the procedure, I applied *firm pressure to the cricothyroid space.* The resultant tone was as low as could be desired, but rough and discordant. Treatment during the two months following was directed *solely* to the proper inflection and placing of the voice.

On May 7th, treatment of the nose was instituted for the very first time, when the turbinate was treated by the combined galvano-cautery and chromic acid method.

At that time, and, indeed, from almost the very first, the voice had lost its puerile character, and was smooth and sonorous.

Case II.—E. L. B., æt. 18, a remarkably well-developed young man was seen November 19, 1897. His conversational voice, sometimes beginning in a whisper, was similar to the falsetto referred to in Case I. The other physical conditions have already been noted. In addition to these, however, it was noticed that during phonation the upper one-third of the right wing of the thyroid cartilage overlapped the left, obliterating the thyroid notch. In this case the initial treatment was the removal of the nasal exostosis and a double amygdalectomy November 23d. It was not considered necessary to remove the lymphoid tissue at the base of the tongue. On December 9th, the operated tissues having completely healed and the voice having undergone *absolutely no change,* the patient delicately reminded me that I had promised to bring about a change in his voice. Being now satisfied that the removal of the obstruction to free nasal respiration, as well as of the offending tonsillar tissue, could not be expected to definitely alter the character of the voice, the method adopted in Case I. was employed, care being taken to mechanically prevent the overlapping of the thyroid plates. The immediate result was the production of low tones, an occasional lapse into the falsetto being attributed to the pathological *habit* which had heretofore obtained. On the three subsequent visits the voice was found to have retained the low tones and to have suffered no lapses into the falsetto.

In view of these results it would seem that nasal and oropharyngeal *obstructions* have nothing to do with the production of the eunuchoid voice.

It will be pertinent to review in this connection the following anatomical points:

"The *cricothyroid* membrane fills the space left vacant between the upper border of the anterior portion of the cricoid cartilage and the lower border of the anterior portion of the thyroid cartilage. Laterally it became blended with the anterior insertion of the vocal bands. The inner surface of the cricoid membrane over its middle portion is covered by mucous membrane, while at the sides the thyro-arytenoid and lateral crico-arytenoid muscles cover it.

"The *lateral cricothyroid ligaments* complete the articulation of the thyroid with the sides of the cricoid by the articulation of the inferior horns of the thyroid with the sides of the cricoid. Each

lateral ligament is composed of two slips—one extending from the cricoid cartilage upward and inward and the other passing outward. These slips serve to protect a capsular ligament lined with synovial membrane and situated between the cricoid and thyroid cartilages.

"The *crico-arytenoid,* the *capsular ligament* of the crico- arytenoid joint, is loose and permits of free extended motion of the arytenoid upon the cricoid cartilage.

"The *cricothyroid muscle* draws the cricoid upward and backward, elongating and rendering tense the vocal cords.

"The *lateral crico-arytenoid muscles,* the cricoid cartilage being the fixed point, serve to turn the arytenoid cartilage upon their pivots by drawing the outer angles of the arytenoids forward, thus throwing the vocal processes inward and closing the glottic opening.

"The *recurrent laryngeal nerve* enters the larynx at the site of the articulation of the lesser horn of the thyroid with the cricoid cartilage, and supplies motion to several muscles, including the arytenoid, and the posterior and lateral crico-arytenoids." (Summarized from "Burnett's System.")

Reasoning from these data, it will be seen that the immobility of the left cord, the left lateral rotation and the unilateral (right) ascent of the larynx can only be regarded and must be diagnosticated, as *complete ankylosis of the left cricothyroid and crico-arytenoid joints,* with a possible mechanical implication of the recurrent of the left side.

Rheumatism, occurring at an early period, would seem more likely to result in an ankylosis than any acute local affection; while an existing diathesis might, from the presence of an acute spasmodic affection causing severe strain on the cricothyroid membrane, develop into an acute, localized, articular rheumatism in a relatively remote situation, *viz.:* the cricothyroid and crico-arytenoid joints, as a gonorrhea will develop a rheumatism in the knee-joint.

That acute rheumatism is not unknown in early childhood is abundantly proven by the post-mortem evidences of endocarditis in the *gamins* of metropolitan cities.

It is easy to see why an ankylosis should remain undiscovered at this time of life, when the voice is normally high-pitched and the tissues easily adjust themselves to altered conditions; and why chest-tones should not mark the transitional period known as puberty.

The diagnosis of ankylosis is confirmed by the fact that firm pressure on the cricothyroid space easily releases the adherent tissues, and a return to normal adduction and tension, with proper apposition of the arytenoids and fixation of the larynx being now insured, the production of low tones becomes possible.

PAPER:

DEDUCTIONS FROM A STUDY OF UNILATERAL NASAL STENOSIS.

BY LEWIS A. COFFIN, M.D.

The fact that in the same individual we so often find the conditions so unlike in the two nasal fossæ, and that given one more or less completely stenosed side of the nose, we are quite certain to find a considerable apparent difference in the condition of mucous membrane secretion and the way in which other functions are performed, has led me to feel that much might be learned and possibly mooted questions settled by a consideration of this condition.

By stenosis, as used in this paper, is meant simply that stenosis, partial or complete, primarily produced by a deformed septum.

Respiration being a muscular act, the air rushing into the lungs on account of the negative pressure there produced by the elevation of the chest walls, it follows that if one of the two channels through which the air should pass in reaching the chest is more or less blocked, that a greater quantity of air will pass through the free channel in a given time. Its velocity will be greater than under normal conditions. In a unilaterally stenosed nose, then, we have the membrane of the free side called upon to act functionally upon more air than under normal conditions, and more exposed to irritation of both a mechanical and chemical nature; also probably being in a direct communication with the air cavity of the lungs, there is a greater negative pressure.

In fact, as I see it, we have an overworked nostril, the membranes of which are open to attacks of inflammatory-producing agents; and the same condition presents in both nostrils of a non-stenosed nose which has been called upon to act upon air in no way proper for respiratory purposes.

The results of the overwork and irritation are not unlike; in

both there is increased blood-supply, increased secretion and infiltration of cells into the tissues, the ultimate disposition of which will probably be in one of three ways: they may be excreted or thrown off in the mucus, giving rise to a muco-purulent discharge; they may remain imprisoned by the tissues, giving rise to an edematous or polypoid condition, or lastly, as connective-tissue cells proliferate and develop, increasing the amount of connective tissue and giving rise, consequently, to a hypertrophy of the membranes.

To my mind, all hypertrophy of the nasal membranes is produced in this way, either by overwork or undue irritation, unless, possibly, it may, in some cases, be produced by a congested condition of the parts produced by pressure.

That in the free side of an unilaterally stenosed nose we frequently find a hypertrophied condition of the membrane, while in the obstructed side the membrane is less hypertrophied or quite normal is, I think, the experience of all. If in the free side, atrophy be found, the membranes of the obstructed side appear less atrophied, hypertrophied or normal—a reverse condition I have seldom seen—and this leads me to a consideration of the several theories as to the etiology of atrophic rhinitis, which are:

1. That it is a cirrhotic condition resulting from a metamorphosis of the connective-tissue cells thrown into the tissues and developed during a state of hypertrophy, into dense fibrous tissue, which, contracting, has a tendency to not only obliterate the venous sinuses of the erectile bodies, but destroys the capillaries about the glands of the mucous membrane, resulting in lack of nutrition to those glands and surface epithelium of the mucous membrane and their consequent atrophy.

2. That it is a condition of membrane having no connection with a previous hypertrophied stage, but that it is a condition following a purulent rhinitis, though how the purulent rhinitis acts to produce the atrophic condition, I have not seen stated.

The 3d, and last theory I have seen advanced is, that atrophic rhinitis is produced by a degenerative process of the trophic nerve-fibers supplying the blood-vessels and unstriped muscular fibers of the mucous membrane.

That in a unilaterally stenosed nose we may have in the free side a hypertrophied condition of membrane, while in the stenosed side the membrane may be apparently normal, or if hypertrophied, to a less extent than in the free side; that we may as frequently have in the free side an aptrohic condition, while in the stenosed

side the membrane may appear normal, hypertrophied or in a less atrophied condition, with or without purulent secretion or history of such, and the fact that we seldom find in the stenosed side an atrophied condition, while in the free side we find a hypertrophied or normal-looking membrane, would point, I think, to the fact that the atrophic state is secondary to the hypertrophic.

I cannot conceive of a hypertrophy with a pathology such as is so well described by Dr. Bosworth without conceiving a resulting cirrhotic and atrophic condition.

The fact that he states in his etiology of atrophic rhinitis that it follows a purulent rhinitis, that purulent rhinitis is a disease of childhood, and atrophic rhinitis is a disease of adult life, is to me but a history of a hypertrophy degenerating into an atrophy. The muco-purulent discharge is an irritant to the mucous membrane, causing an increased blood-supply and consequent hypertrophy. This I consider can take place without producing the apparent tumefaction of the membrane which we are accustomed to look for in hypertrophic rhinitis, as the membrane bathed with muco-purulent discharge will not act functionally upon the air, and, therefore, the venous sinuses of the erectile bodies are not filled.

The third theory, it seems to me, states the effect as cause. With an atrophic or cirrhotic rhinitis, with the blood-vessels obliterated, the muscles bound down and glands diseased, we must certainly have a degenerative process of the trophic nerve-fibers which have come to no use, but rather, I should say, as a result than as a cause of the cirrhotic condition.

Of the treatment of all inflammatory catarrhal conditions of the nose, I think Dr. Greville McDonald strikes the key-note when he advises for the treatment of atrophic conditions cleanliness and rest, tritely saying: "Never stimulate an organ which has struck work." It is not my purpose to dwell upon details of treatment before this body. I wish simply to say that I feel that we should all probably give more attention to the conditions under which our patients live, giving especial thought and direction as to the condition of the air which we breathe. Proper heating and ventilating of the homes and public buildings should receive greater attention.

One thing more. Since our worthy and eminent President some years ago brought so emphatically before the medical profession the relations of aural and nasal diseases, I think it has become quite universally recognized that the relation exists,

but I am not so certain that the reason for such dependence of aural upon nasal diseases has been made apparent. The density of air in a cavity over the mouth of which there flows a current of air will depend upon the velocity, direction, and volume of air passing over the open mouth, and, as accompanying unilateral stenosis of the nose, we so often have catarrhal disease of either or both ears can we not attribute the change in the ear to the negative pressure produced in the Eustachian tube by the change in the current of air passing over its open end?

DISCUSSION.

Dr. Geo. L. Richards, Fall River, Mass.: A woman who was treated by me some three years ago had the most exaggerated case of atrophic rhinitis in one nostril that I have ever seen. There was complete closure of the other nostril, due to a deviated septum. I induced her to allow me to operate upon the septum, and without any further treatment of the atrophic rhinitis she disappeared entirely from my notice for a period of about one and a half years, when she returned. There had been no treatment, except more or less desultory attempts at cleansing. I found entire absence of disagreeable odor and in the nasal cavities a small quantity of thin mucus, not especially adherent, and easily removed. With the reëstablishment of normal nasal breathing in each nostril, Nature had largely cured the atrophic condition. Where one nostril does all the work atrophy is very likely to occur, and the stenosis of the opposite nostril, if present, should be operated upon to prevent this atrophy, if for no other reason.

PAPER:

THE AFTER-TREATMENT OF RESTORED DEFLECTED NASAL SEPTUM.

BY CHARLES W. RICHARDSON, M.D.

The subject of this paper has been suggested to me on account of the fact that in most of the papers written upon operative work upon the deflected septum, and in discussions following these papers, the period for the wearing of the splint has differed so from my later experience in this work that I think it well to offer some suggestions with regard to this subject. In septal work a great deal depends upon the after-treatment of the case, as regards the patient's comfort and the ultimate success of the operation.

One must conclude from the papers written upon this subject, and the discussions thereon, that this is an operation of extreme simplicity, with the evident absence of discomfort to the patient; with lack of inflammatory reaction; with the ease with which the splint is removed and reintroduced, and the absence of annoying complications. Operators who have had much experience in this work, I am sure, will agree with me that in 90 per cent. of these cases the above-stated deductions do not hold good. No one can deny the fact that the wearing of a foreign body within the nasal cavity, which is required to fit snugly, producing slight pressure, is attended with some pain. The pain is greatest during the first week, and becomes less as the wearing is prolonged, but is not absolutely relieved until the foreign body, producing pressure, is removed. Nor can the fact be denied that such a body as a splint of hard rubber placed within the nasal cavity will produce temperature and inflammatory reaction. About the edges of such a foreign body, especially when placed in such a vascular organ as the nasal cavity, we are apt to and do have exuberant growth of granulation tissue in proportion to the length of time the foreign body is worn.

I have given above three such self-evident propositions that they require no argument to sustain them.

How to lessen the severity of the condition above mentioned will be the purpose of this short paper. Whatever operation is done to relieve a deflected septum, it is necessary that the resilience

of the septum should be destroyed and a splint be introduced within the nasal cavity to hold the septum in position until union has taken place and the septum has become fixed in its new position. It has been my experience that if the operation be done well and thoroughly the retention splint is usually only required for a period of about ten days. I have also found that the comfort of the patient is not increased by the removal and reinsertion of the splint during any period of the wearing of the same splint, nor the ultimate result of the operation enhanced thereby.

After an operation upon a deflected septum I consider it sound medical practice to keep my patient abed until he is practically free of fever. He is more comfortable and better protected from unpleasant complications. This period usually averages about four days. I know that some operators do this operation without having temperature, but I have never been so successful in this line, and, therefore, prefer to keep my patients quite abed until the temperature period is passed. Irrigation of the nasal cavity with a carbolized alkaline solution is resorted to three times daily, and the surgeon dresses the case carefully once a day, removing all crusts that accumulate about and within the splint. General and local treatment is resorted to, so as to make the patient as comfortable as possible. The patient is placed upon a low diet. Formerly I resorted to the method of daily removing the splint, cleansing the cavity, and reintroducing the splint. Latterly, during the past two years, I have not invariably resorted to the removal of the splint until its final withdrawal at the end of ten days.

I know that it is stated that the removal of the splint and the introduction of another is devoid of pain, but such has never been my experience. In some rare instances, after the second or third withdrawal and insertion, there is no pain, but this has been the exception. In some cases, especially where the deflection involves the osseous structures, which are being well held in position by the primary splint, the removal of the splint occasionally allows one of the fragments to drop back a little into the old position, so that when the attempt is made to reintroduce the clean splint we find not only some difficulty in applying the splint, but often cause the patient hours of exquisite agony. After causing considerable pain to one of my patients, in a case of the type narrated above, I concluded to try the continuous retention of the splint for a period of a week. I felt convinced that the nasal cavity could be kept clean by frequent cleansing, and that

by holding the septum immobile for a shorter period more could be accomplished than by the constant meddling over a longer period. With some feelings of anxiety I watched the first case, which progressed unusually favorably. On the seventh day I removed the splint and reintroduced another, which latter was removed on the ninth day. The splint was never reintroduced. The result was perfect.

Since treating the first case with such marked success I have followed the same course in almost all of my subsequent cases, and with the same degree of success. The septum remains absolutely in the same position given it, and shows no more tendency to sag back into the old position than it did when I formerly required my patients to wear the splint for a period of thirty days. Formerly I found that in some of my cases I was terribly annoyed by granulations; in the short period of wearing the splint they are very infrequent, and when occurring never reach sufficient size to require attention. Temperature range is, if anything, less and of shorter duration than in my former cases. The neuralgic pains, which are present more or less in every case, are about the same whether the splint is worn continuously or changed frequently. Pains of a neuralgic character occasionally cease only with the absolute dispensing with the wearing of the splint; therefore, the relief is somewhat earlier in these cases when the splint is worn ten days than when it is worn thirty days. The discomfort due to the wearing of the splint is somewhat great, and if this can be reduced, as it can be by lessening the duration of the wearing of the splint and without imperiling the result of the operation, it should be done.

In conclusion, I would state that in all cases of horizontal deflection of the septum, involving either the osseous or cartilaginous septum, or both, and in many of the vertical deflections involving the cartilaginous septum, the result of the operation is as satisfactory with a short continuous wearing of the splint as in a longer period of wearing, attended with frequent changing of the splint, and all discomfort to the patient is markedly lessened by the shorter period of the wearing of the splint.

DISCUSSION.

Dr. JOHN O. ROE, Rochester, N. Y.: My experience in the after-treatment of restored deflected nasal septum is somewhat different from that of my friend, Dr. Richardson, in regard to the length of time that the dressing or splint should be worn; or, in

other words, the length of time that the septum requires support.

Since I devised my method for correcting deflections of the nasal septum, about six years ago, I have been able in nearly all cases to dispense with the splint in from three to five days after the operation. When support is required for a longer period than this I regard the operation as having been imperfectly performed, on account of the fact that all the resistance or resiliency of the cartilaginous portion of the septum had not been thoroughly overcome or that the osseous portion had not been sufficiently broken up.

Deflection of the septum may be divided into two classes, one in which there is deviation of the cartilaginous portion alone, which constitutes about one-third of the cases; the other in which both the cartilaginous and osseous portions are deflected, which comprises the remaining two-thirds. The osseous portion alone may be deflected, but it does not occur sufficiently often to require especial consideration. The operation devised by Steel and modified by Asch, is an operation for the correction of deviation of the cartilaginous portion alone, and, with all respect to my friend, Dr. Asch, I do not think it should be described as an operation for the correction of deflections of the cartilaginous portion alone, which is an excellent operation in many cases.

The method which I have adopted is as follows: Suppose we have to correct a deviation of both the cartilaginous and the anterior portion of the osseous portion, it is important to overcome thoroughly the elasticity of the cartilaginous portion. For this purpose I first make an oblique incision through the central portion of the deflected portion, beginning just above the point of the greatest curve. I make an oblique incision downward with a slender cartilage-knife, with a finger in the opposite nostril. As the knife nears the perichondrium, on the opposite side, the knife can readily be detected with the finger. Care is then taken not to cut through the perichondrium, but to take a thin, smooth, slender spatula and raise the perichondrium for a short distance downwards to afford sufficient space for the upper edge of the cartilage to slide into. A perpendicular incision is then made at the point of the greatest deflection in the same manner as the first incision, and the perichondrium also raised for a short distance back. A longitudinal incision is then made at the beginning of the deflection, along the upper and lower border with the finger in the opposite nostril to prevent cutting through the perichondrium and mucous membrane on the other side. In this manner the elasticity of the cartilaginous portion of the deflection is entirely overcome. The anterior edge of the osseous portion of the septum offers no resistance when thoroughly broken up, and the resistance of the posterior edge of the cartilaginous portion is overcome with the correction of the osseous portion. The latter is done with the instruments that I devised for this purpose, and with which you are doubtless all more or less familiar.

In performing the operation the instrument is inserted with

the male blade on the convex side of the septum. If the passage is very greatly narrowed or entirely obstructed, room can be made for the blade by pressing the septum over with a blunt spatula, which goes with the set of instruments. If the osseous portion is thoroughly broken up, which can be done with this fenestrated blade without injury to the soft tissue, and the elasticity of the cartilaginous portion completely overcome, the septum can be put in any position desired, it being necessary simply to place a dressing or support on one side, which should be the one toward which the septum has previously been deflected. This support should be of sufficient size to maintain the septum directly in the center, for, if too large, the septum can readily be forced over to the other side. The dressing I employ is cotton wound on a flat piece of metal of suitable size. Before this is inserted the nostril should be thoroughly irrigated and made aseptic with a solution of bichloride of mercury, one to five thousand. It is then dusted with iodoform, nasophen, or other antiseptic powder, and the plug inserted. If the nostril is made thoroughly aseptic, this dressing can be left in from four to five days without removal; by this time the septum is rendered sufficiently firm by the provisional callous thrown out from the osseous fragments to hold the septum erect. By having the elasticity of the septum so thoroughly overcome, the dressing is rendered entirely painless, for it is the pressure of the septum against the dressing that causes the pain in these cases. Before the operation is undertaken for correction of the deviation, all spurs and ridges of the septum should be removed.

Of course we recognize the fact that no two cases are exactly alike, and that each must be dealt with according to the conditions found, but this is the general plan which I adopt, with very gratifying results. In adults cocaine anesthesia is usually sufficient, at least all the preliminary work can be done under cocaine, or in cases where cocaine is not well borne, I employ eucaine. In some cases a little chloroform is necessary just at the time of breaking the osseous portion. Unusually there is very little constitutional disturbance from the operation, and as there is not pain following it, and no septic condition to cause any constitutional disturbance, the patient usually goes about his affairs, scarcely feeling worse than with an ordinary cold in the head. When the operation is required in children, and sometimes in very nervous or timid adults, particularly females, general anesthesia is required.

Dr. Phillips: I would like to ask if Dr. Roe has ever had a serious secondary hemorrhage.

Dr. Roe: I never have had any hemorrhage in straightening the nasal septum since I devised these instruments for straightening the septum, and have employed this method of dressing the nose.

Dr. Phillips: A friend of mine had a very serious experience in a case on which he operated. The hemorrhage was exceedingly

severe, and it was almost impossible to control it by either post-nasal plugging or other means, and he was finally compelled to resort to intravenous injections to sustain the patient.

Dr. Roe: Doubtless a hard-rubber tube was used. In cases where there is a tendency to bleed during the operation the aqueous extract of the suprarenal glands is of service, and directly after the operation I use the cotton plug, saturated with the bichloride solution, and then pour over it a small amount of a saturated solution of tannin in alcohol, which readily controls all hemorrhage.

Dr. Phillips: In the case of which I speak the operation was performed about three o'clock in the afternoon and the hemorrhage commenced in the evening.

Dr. Roe: If this method of plugging the nose which I have described had been employed, I am quite of the opinion that there would have been no hemorrhage. Hemorrhage from the cartilaginous portion of the nose can generally be very easily controlled by grasping the nose between the thumb and finger as close to the face as possible, and by holding it firmly for a few minutes the bleeding will cease.

Dr. Robert C. Myles, New York: This subject has excited a great deal of interest in the City of New York lately, and at the present time there is a very enthusiastic crusade in favor of the Asch operation. My experience differs a little from some authorities on the subject—I have had some failures. I have observed that for the union to become fixed, it takes from six weeks to two months. I have never seen any case in which the elasticity of the cartilaginous portion has been destroyed, save by incision. You can stretch it, double it up, but it will go back again. If one goes further, and breaks the bony plates of the ethmoid, vomer, and the nasal spine, he will secure fixation by osseous union, with little interference from resiliency. The vomer is quite thick in its anterior inferior part, and I have never been able to fracture it properly without ether.

Dr. Wendell C. Phillips, New York: I have been very much interested in the paper and in the discussion, especially with the remarks of Dr. Roe, and his description of his operation. Now, I think Dr. Roe's experience is very unique, for it differs materially from that of operators in general whom I have heard speak upon the subject. In my experience it is a serious bloody operation. I have never done the operation without severe hemorrhage, not necessarily dangerous, perhaps, but certainly severe. I cannot understand how Dr. Roe can cut a cartilaginous septum, make two incisions, through the septum, without cutting blood-vessels in many places, which would give rise to serious hemorrhage. As to the destruction of the bony septum, I very much question whether we ever fracture the bone septum to any extent. We may separate the cartilaginous from the bony portion, but I have always felt that we never do get far back into the bony portion. I am very glad that Dr. Roe can accomplish so much in such a remarkable manner, and I wish

I could do it myself. The Asch operation, so far as cartilaginous septum is concerned, has furnished a good proportion of successes. I regard two things as essential in every operation. First, to overcome the resilience of the septum, and the second is to get a suitable splint, and hold it in place long enough to get such a union that there will be no falling back again. Now, in New York, where I am familiar with the methods in use, the splints are left in from four to six weeks. There is also following these operations very often serious secondary inflammation, and there is a great deal of swelling of the tissue, so much so, that it is customary in severe cases to keep iced cloths upon the nose a day or two. I wish very much we had one of these cases here now, that we could see the operation performed in the manner indicated by Dr. Roe. I am sure we would all appreciate it very much.

Dr. Henry L. Wagner, San Francisco: Referring to serious hemorrhages of the upper respiratory organs, I must admit that I have had cases in which very serious hemorrhages have occurred, but of late I have been using a preparation, which has been advocated, to retract the blood-vessels in mucous membranes. I have reference to the extract of the suprarenal capsule. I have applied it before the operation, and have had hardly any bleeding. In tonsillotomy, I have injected a few drops into the crypts, and only a few drops of blood appeared. First apply the cocaine, and then the preparation. I am using within the last few months a more concentrated solution, and have had no bleeding whatever. It is certainly a great source of confidence, both for the doctor as well as to his patient, to know that the operation can be performed without any hemorrhage.

Dr. Holbrook Curtis, New York: When I hear men talk in this way about no hemorrhage and about the extract of the suprarenal capsule, it seems to me almost as miraculous as the story of the loaves and the fishes. Of course, we do not have serious hemorrhage in all of these cases. We may operate on case after case with little or no hemorrhage, but the time will come to all of us when we will get hemorrhage that will be almost impossible to control, and it may get to Dr. Roe about next week, and he will have to resort to every measure known to surgical science to control it, and before he controls it, he may wonder why surgical science has not devised a more satisfactory and certain method of doing so.

Dr. Chas. W. Richardson, Washington, D. C.: Dr. Roe says that he disagrees with me, but I think he agrees with me. I quite agree with him. If the deflection is thoroughly broken down, and there is absolute and complete support at the back and side, I think within a week sufficient union will have taken place to warrant the removal of the splints. I know, as Dr. Myles has said, of the importance of leaving the nose in a good breathing condition, but in the majority of cases, if great care is taken in the operation, we can get good breathing. I, in company with

most of the other gentlemen who have spoken, have had my experience with severe hemorrhages. I had one about three weeks ago, and sat up with the patient for over three hours. And when the bleeding was finally stopped, it was due to kind providence rather than any efforts on my part. As to the use of the suprarenal capsule extract, I have seen several good reports of the use of this remedy, and I am inclined to try it myself.

PAPER:

BASIL AND BASILATERAL DISEASES OF THE FAUCIAL TONSILS, WITH IMPROVED INSTRUMENTS FOR TREATMENT OF SAME.

BY ROBERT C. MYLES, M.D.

So much has been written about the faucial tonsils it would seem that no valid excuse could be made for another paper. While I hesitate to approach the subject I think I am justified in calling your attention to the pathological conditions at the base and at the contiguous sides of these troublesome organs which are often overlooked, neglected, or misinterpreted.

I have seen diseases in the above-mentioned areas of which neither the anatimo-pathological conditions were adequately described, nor the details of what I consider a correct surgical treatment for them given in a manner which is withal complete and sufficiently forcible. Most writers in describing one of the conditions of which I treat, speak of it as adhesions to the pillars of the fauces. Now it is this condition which I claim is very rarely found and is of little pathological importance. The conditions which I shall consider are first a hypertrophy of the tonsils extending outwardly and laterally into the tissues of the neck or oropharynx and soft palate, as distinguished from those cases where the tonsils extend into the free pharyngeal space and are more or less pedunculated.

The anatomy of the tonsils, their structure and their relations to the blood-vessels and contiguous tissues are of importance in this connection. I wish to present an anatomical wet specimen showing the relation of the carotid and ascending pharyngeal arteries to the tonsils. You will note that a section has been made on each side through the posterior lateral wall of the oropharynx, and a string has been placed around the artery. This demonstrates that the artery in its normal condition is situated from one

and one-eight to one and one-fourth inches posterior to that part of the palate which is usually selected for the incision in peritonsillar abscesses. You will also note that the artery is from one-eighth to one-third of an inch external to this line of incision when made antero-posteriorly. I have dissected the tonsil from its basic capsule, and it is still attached to the inferior part of its receptacle; this will show you a peritonsillar space and a rather extensive area in which pus may accumulate anterior to the superior constrictor muscle, and also the avenue through which pus may burrow through and under the anterior inferior edge of the superior constrictor muscle.

I report three cases, as types of the graver forms of basilar tonsillitis.

Case I.—Age about 25. An interesting type of fibrous atrophy of the tonsil which had caused an almost constant cough for several years, so frequent and irritating indeed was it that the patient said life was a burden to him, for neither internal medication nor local application gave him any relief. His tonsils were small and hidden behind the pillars. On pulling forward the right anterior pillar I noticed a peculiar fibrous-looking mass situated close to the posterior part of the tonsillar space, and on touching this mass with a probe I was surprised to find that it brought on the characteristic cough. I at once applied the electric cautery and made a clean cut through the tissue to its very base and into the connective tissue itself. As the knife struck this point he exclaimed: "That's the spot, you've struck it!" From that time his cough ceased. Some seven years afterward he came to me complaining of a cough with some of the old-time characteristics. I burned away part of the remaining tonsillar tissue with consequent relief.

Case II.—Mrs. W. B. C. This patient had as many as six abscecesses in the right tonsil ear area in one year and had been troubled for fifteen years. She had become emaciated and almost a complete invalid, her ill-health apparently being due solely to the continued inflammatory state of the right faucial and cervical regions. She complained of pain in the right side of the throat, the trachea, and chest, sensitiveness in the right ear, and was troubled with a distressing cough which was generally worse in the morning.

I found the right tonsil extremely hypertrophied, extending nearly three-quarters of an inch into the oropharyngeal wall. It was very hard, and could be felt beneath the posterior and anterior pillars, extending up into the soft palate. The glands of the neck

were enlarged and there was a firm mass which could be felt externally in the region of the right tonsil. Careful examination showed a chronic discharge from a small aperture in the upper part of the tonsil, which a probe showed to be over an inch in depth and revealed a cavity which contained a débris of cheesy matter, epithelium, and pus. I excised the median line of the cavity with rongeur forceps and cautery knife and removed certain parts of the hypertrophied tonsil. The patient subsequently improved in local and general health until several months later; small suppurative areas then developed under the posterior side of the tonsil and beneath the posterior pillar, which annoyed her until she visited New York again, when I dissected these cavities away and afforded her immediate relief. The difficulties, I might remark, in dissecting away these small tonsillar masses from the basic capsules are considerable.

Case III.—Mrs. S. Came complaining of repeated attacks of quinsy, having had four or five during the former winter. The right tonsil was not very large, but there was considerable firmness in the deep structures around its base. I treated her during two or three attacks, opening the abscesses through the anterior pillar just posterior to the hardened mass and cauterized the tonsil rather deeply with the cautery knife. A peculiarity in this case was the short time which elapsed from the beginning of the attack to the formation of the pus; it was usually from thirty-six to sixty hours. On the last occasion that I treated her I did not reach her house until some hours after being called, less than twenty-four hours indeed from the time the initial symptoms began, but when I arrived I found that the abscess had already broken. Examination showed that the pus from the peritonsillar region was issuing through the groove which I had made with the cautery. A blunt probe passed into this opening showed a large cavity which seemed to pass even below the lower end of the tonsil. Later I removed part of the median wall of this cavity, which was in reality the base of the tonsil itself, and curetted its walls. A year and a half afterwards she had had no return of her trouble.

The tonsils belong, generally speaking, to the lymphatic system, the mucous membrane and epithelium of the mouth and throat dipping into and lining the crypts of the gland. It was Delavan, we believe, who first called atention to the fact that the epithelium at the base of the glands was much thinner than at the top, which accounts for the ready absorption of septic material, and explains the fact that diseases of this part of the organ are much

more liable to spread to the neighboring parts and to produce general infection.

The physiology and function of the tonsils need not detain us. Many theories and plausible suggestions have been advanced, but none have been scientifically sustained. The oldest advocates contend that the tonsils secrete a substance which aids deglutition; others, that the tonsils are blood-elaborating organs; and still others, that they are the habitat of phagocytes, acting as sentinels to prevent foreign matter from entering the body either through the throat or the blood.

The causation of tonsil hypertrophy and disease has been the source of volumes of useless discussion. It seems to be the nature of the lymphoid tissue in certain individuals to undergo hypertrophy. In the tonsils of one case, for instance, the hypertrophy will be confined chiefly to the base. The rheumatic theory concerning the causation of tonsillar disease has been advocated by able writers; they, however, rely much more upon surgical than upon rheumatic treatment. The tonsillar tissue, in my opinion, becomes thickened by repeated inflammatory conditions, caused primarily by abrasions or irritation spots or areas in the nose, throat, or mouth, septic material being taken up by the lymphoid vessels and transmitted to the glands of the lymphoid ring and the cervical region; and by a peculiar disposition of the individual to adenoid hypertrophy. The functions of the glands become perverted by the mechanical pressure and form a favorable nidus for bacterial activity, and we find as a result basic hypertrophy, retained secretions, and purulent collections.

Naturally, the hypertrophy of which I am particularly speaking is found at the base or on the sides of the tonsils, that is, a basic or basilateral hypertrophy which pushes out the tonsils into the pharyngeal space, carrying with it the faucial pillars, and giving the appearance of an attachment from the inflammatory process having been formed between the tonsil and the pillars.

It is in such cases as these that the diagnosis needs careful attention, and they frequently present obscure symptoms which require much practical skill to determine the relationship between cause and effect, and it is often difficult to decide how much of the tissue should be removed, especially where the enlarged organ presses upon and makes tense the mucous membrane itself and the fibrous and connective tissue of the subadjacent investing sheath. The diagnosis can be more completely and accurately made by a careful method of palpation with the index-

finger. Sometimes a large hardened mass of fibro-lymphoid tissue can be found by the sense of touch, where ocular inspection has failed as a means of determining the extent of the pathological state.

The chief symptoms in cases of basic hypertrophy are a peculiar pharyngeal cough, soreness in swallowing, dull aching sensation extending upward towards the ear, redness and tenderness of the faucial pillars, protrusion of the tonsillar wall toward the median line, and an occasional discharge of offensive cheesy matter from some part of the tonsils.

In my experience, a small dull malleable handle curette passed into a crypt of the tonsil, together with palpation, usually serves to make a positive diagnosis. Where the tonsil lies deeply within the cavity between the pillars, the anterior pillar should be drawn forward with a dull hook. This manipulation usually causes the patient to gag, and the superficial face of the crypts will be prominently brought into view.

In the treatment of these cases of hypertrophy of the basic

a . FIG. 1.

parts of the tonsil (I apply this description to those cases where the tonsil does not extend beyond the margin of the pharyngeal mucous membrane or the opercular fold of Harrison Allen) it is my practise partly to dissect out before excising the offending gland.

I would like to call your attention especially to a knife which I have recently had constructed by Ermold. (See figure 1, *a*.). It is seven inches long, has a slender shank about 3 and ½ inches in length, and 3 and ½ inches of a flat handle. It is made in the shape of a scythe, forming a complete half circle, the diameter of the circle being about six millimeters. It is so constructed that the one knife will serve for severing the tonsils from their investing sheaths on either side. For instance, on the right it cuts upward and on the left it cuts downward; it will also cut by turning the handle or moving it either upward or downward. It is especially useful in splitting open the crypts. It is possible that a knife similar in pattern has been presented before, but I have

never seen one of this exact shape nor one which cuts so rapidly.

I wish to present to you also in connection with my paper some punch and die forceps. Three are of my own construction, one of which I have used for several years (the lateral punch forceps) and two others which I have recently devised. One is made after the bird or turtle-beak pattern with ordinary rongeur handle and is made by E. B. Meyrowitz; the other one is an adaptation of the bird or turtle-beak cutting extremity, with punch and die rongeur handle, made for me by Geo. Ermold. They are very strong, and will remove the average tonsillar tissue in cleanly manner and without the usual dragging of the fibrous tissue. For some time I used the electric cautery for this purpose, but not always with success. Later I used different forms of punch and die or a rongeur forceps in conjunction with an electric or cold-snare or knife. As a rule this treatment gave excellent results, but, in certain cases, was followed by severe inflammation from the burning of the capsule or the pillars with the electric cautery. I therefore abandoned this procedure for the average case, and now use delicate knives, such as I have here, to dissect the lymphoid tissues from the pharyngeal mucous membrane, and from its own fibrous investing sheath. The operation is briefly as follows:

The tongue being depressed by patient or assistant the tonsil is seized with a tenaculum or vulsella forceps. The knife is then inserted to a depth of from three to six millimeters, and passed through the anterior and posterior margins of the tonsil, thereby severing the connection between it and the pharyngeal mucous membrane. I should have said that from five to ten minutes before operating I apply a very strong solution of cocaine (20 per cent. to saturation) over the parts, and also inject a 2 per cent. or a Schleich solution only as far as the conditions present justify, removing as much of the diseased tissue in one operation as seems expedient. Some cases require but a few visits, about a week apart; but others, especially in frail and delicate women, where the hypertrophy has extended deeply into the neck, the course of treatment should be extended over a much longer time. I have never personally had a serious hemorrhage in these cases, which may be due to the law of average, or because I had not wounded the capsular sheath, and I have found that when the dissection and excision are cleverly done the result is extremely satisfactory. After the operation strong antiseptic mouth-washes should be prescribed and used.

Dr. Hodenpyl has kindly assisted me in the preparation of

some microscopic slides from a specimen obtained from a case of basic tonsillar hypertrophy, and these seem to show that what we have been accustomed to call adhesions between the pillars and the tonsil are in reality only normal attachments of the tonsils to the mucous membrane capsule, where the normal relation between them has been altered through the mass having been pushed out into the pharyngeal space by the hypertrophy of the base of the tonsil.

When the diseased area of the tonsil is confined to a few central crypts, I have found the most effective method of treatment to be excision with the author's lateral-punch forceps. The upper beak I insert into the crypts, and after excising the intervening tissue, make a deep excavation with a small electric point. In still other cases the hypertrophy seems to take place chiefly near the margins of the mucous membrane and the lateral investing sheath, and sometimes indirectly causes the glands to atrophy by lessening the blood-supply. In cases of children where the tonsils grow again after removal, I have found that they were instances of basic hypertrophy. It has been my practice in such cases, after having loosened the capsule with the knife as far as possible, and having excised the tonsil with the guillotine, to excise the base with some form of punch-forceps. In cases of peritonsillar abscess I am accustomed first to apply cocaine to the region, and, after carefully marking the base of the tonsil with the index-finger, I insert a hypodermic-needle in the soft palate at the most suspicious part and two millimeters external to the firm margin of the base of the tonsil. I endeavor as far as possible in this procedure to so manipulate the syringe that about one drop of a four-per-cent. solution should be inserted in every three millimeters of tissue, the needle being gradually pushed deeper, say to about three-quarters of an inch, unless it enters an unresisting cavity sooner. As rapidly as possible I then pass along the track of the needle to the depth of from a quarter to a third of an inch, a sharp, protected Graefe knife, with which an incision is made. If I find no pus, more cocaine is used, and the tissues are teased apart with a probe or other dull instrument to a depth of from one-half to three-quarters of an inch, naturally following the direction towards the region of the most concentrated inflammation.

In my experience, after this procedure, on the second or third day of the disease, I am usually rewarded by the discharge of a pinkish, pale fluid, which in its turn in a day or two is changed to a thick, purulent outflow. If the

pus is external to the tonsil it is usually found by this method after the fourth day from the onset of the disease and if the focus of the inflammatory action is in the region of the posterior pillar it is usually reached with more difficulty and later in the course of the disease. The preventive treatment in these cases is the same that I use in cases of basic hypertrophy, except that both varieties of condensed and hypertrophied hyperplastic tissue in the region of the basic capsule are removed.

With regard to the basic diseases caused by syphilis, malignant growths, calculi, elongated styloid processes, bone in the tonsil, etc., I need not detain you except to say that I have met with several cases of hidden gumma in the base of the tonsil, which specific treatment has cleared up in a few weeks. I remember that I have had two cases of ulceration which I was led to attribute to a disturbance of the nerves, and I have seen several cases of basic disease of the tonsils, due to exostosis of the angle of the inferior maxillary bone, or to an elongation of the styloid process. In one I removed a part of the exostosis of the inferior maxillary, thereby greatly relieving the patient.

PAPER:

REPORT OF TWO CASES OF NASAL ADHESIVE-TISSUE STENOSIS, CONGENITAL AND SCARLATINAL.

BY ROBERT C. MYLES, M.D.

The two cases of nasal adhesive-tissue stenosis which I wish to present to you will, I hope, be interesting on account of the problems occurring during the treatment. One is that of a man, aged twenty-four, and the other that of a woman, aged thirty. They were both operated upon the same day—December 14, 1897.

The case of the man is one of congenital occlusion, and presented the physical conditions which I have found previously in two similar cases. The atresia was located in the posterior third of the nasal chamber, and there was a thickening of the bone in the lateral and inferior walls, which formed a semicircular projection, two to four millimeters above the surface of the adjoining bone. The exostotic development pressed against the posterior end of the inferior turbinated body, and formed a basin-like cavity in the floor of the nose.

The case of the woman was probably due to an attack of scarlet fever in childhood. The patient had never been able to breathe through the nostril from the time of the attack of this disease. The opposite nostril had also been involved, and was operated upon one year ago by myself with perfect success.

In this case the adhesive tissue extended from the middle turbinal down to the floor. The anterior wall of the adhesion extended from the vestibule of the nose in an oblique direction upward and backward and united with the middle turbinated about midway the hiatus semi-lunaris. Muco-pus issued from the respective sinuses, flowed downward over the adhesion and frequently without warning appeared upon the upper lip.

In the case of the man I removed a part of the posterior end of the inferior turbinated, and passed the index-finger of the left hand through the mouth and into the posterior nares. Then, with the right hand, I used a long trephine through the anterior nares, which was regulated and directed by the sensation of the left forefinger. I bored until the teeth of the instrument were felt on the end of the finger. The aperture was enlarged with antero-posterior Rongeur forceps, the author's long-guarded trephine was also used, and the opening was packed with cotton saturated with a solution of 1-5000 bichloride of mercury, and this was left *in situ* for a few days. The patient suffered for several days from surgical fever of a mild type, with headache and malaise. Tubage was employed for about two weeks. Breathing through the nostril is now good. The aperature is about two-thirds its normal size.

In the case of the woman, adhesions existed to the extent of two inches along the floor of the nose. I trephined along the lower border of the adhesion about one and a half inches, avoiding entrance into the posterior nares at the first sitting, my object being to ascertain whether or not I could relieve this part of the adhesion without suppurative or general systemic disturbances, which I have always found to occur when the posterior naris was entered.

I excavated that part of the tissuse which had been liberated from the turbinal, septum, and the floor of the naris with the gouge and rongeur forceps, partially filled the cavity with a mixture of aristol and boric-acid powder, and packed it rather tightly with pledgets of borated and bichloride cotton. I kept this procedure up for about six weeks without any systemic or local inflammatory action. I will also say that I had made the anterior

part of the nose as aseptic as alcohol and bichloride solution could render it, and, notwithstanding the fact that the muco-pus discharged constantly over the region from the sinuses, there was no bacterial infection. At the end of the six weeks I determined to continue the trephining into the posterior nares, and this was carried out with the hand-trephine, after the manner described in the other case. It was done under aseptic precautions, and the opening into the posterior part was enlarged with the rongeur forceps. An aseptic tube was then passed through into the posterior naris. This part of the operation was not half so severe and extensive as the former, but on account of necessary infection from the posterior nares, there was a certain amount of fever and general inflammation in this section, due, in my opinion, to the bacteria which normally inhabit the rhinopharyngeal region. My object in this latter case was to tube the floor, making the opening along and close to the floor, using the adhesion above as a base to hold the tube down, so that when complete union had taken place, the pressure had caused a formative tissue, which did not have a tendency thereafter to rise upward and block the lumen of the inferior part of the nasal fossa. These tubes, or some solid substance similar in shape, should be worn from six weeks to six months.

The chief points of interest in these cases are: First, infection can be obviated until the rhinopharynx is entered; second, that it is essential to make an opening along the floor and to get complete union by tubage before the other part is removed; and, third, that in congenital cases new-bone tissue seems to form beneath the parts where the adhesions have taken place, while in acquired cases the bone seems to be in approximately normal state.

I will state, in the case of the woman, that she had been referred to and had consulted some of the most eminent rhinologists, who had declared that her case was inoperable, who had doomed her to eternal mouth-breathing, and the annoyance of muco-pus suddenly flowing upon her lips, with no ability to relieve the condition, save that of mopping the anterior nares.

The relief experienced as a consequence of the operations compensates the patient a thousand times for any pain or inconvenience she may have suffered.

PAPER:

SOME ANATOMICAL POINTS IN THE STRUCTURE OF THE LINGUAL TONSIL OF PRACTICAL BEARING ON ITS PATHOLOGY.

BY LENNOX BROWNE, F.R.C.S.

Kronenberg in his classical articles on diseases of the fourth tonsil, which appeared in the *Berliner medicinische Wochenschrift* in 1894, is so good as to ascribe to me "the merit of having decidedly demonstrated, that the complication of symptoms which has been called *globus hystericus*, and which up to that time had been considered the expression of the functional neurosis, is frequently due to real anatomical changes in this region, and had only been overlooked because examination had been incomplete." And Escat of Toulouse, in a recent and very complete report on the subject, to be presented to the French Society of Otology, Laryngology and Rhinology, also says that "Lennox Browne appears to be the first author who has occupied himself with hypertrophy of the lingual tonsil." These remarks refer to my communication to the International Congress of Laryngologists, held at Milan in 1880. Since that time the literature of this region has become so considerable that a complete bibliographical list contains the names of at least one hundred authors of all nations, who have contributed to our information on the subject.

As usual in matters laryngological, the United States is well represented, and I find recognition of the importance of diseases of the lingual tonsil in articles by Holbrook Curtis (1884 and 1889); Gleitsmann (1887); Beverley Robinson (1888); Farlow (1888); Roe (1889); Richardson (1889); Clark (1890 and 1896); Bosworth (1892); Clarence Rice (1894); Chamberlain (1894); Bryan (1896); Quinlan (1897), and Bernays. There may be others whom I have overlooked. I do not fear, therefore, that at your Association I shall find sympathy with the "all but" contemptuous manner with which the subject is ignored in the contribution on diseases of the nose, pharynx, and larynx to the latest British system of Medicine; for what is said is contained in less than twenty lines in an article which extends to close on two hundred pages. I may perhaps remark that, short as the observations are, they contain one

original suggestion; namely, that "the employment of the galvano-cautery, which is often recommended, is not free from the risk of causing violent parotitis." I presume that "parotiditis" was the word intended to be used, but in any case, those of us who are anatomists, as well as those who are surgeons—and the throat specialist should be both—can afford to smile at this timorous warning.

The reason I quote this article is that, presumably representing the most recent views, it assumes that there is an absolute identity between diseases of the lingual tonsils and of the palatine tonsils, and this is a very general misconception. It is, however, not supported by what we know of the anatomical and histological features of the various tonsillar structures which enter into the formation of the lymphoid ring of Waldeyer. For example, Escat has given it as his opinion that the lingual tonsil is, in the young child, not only fully developed (in this he differs from Bickel) but at its period of greatest vitality; and that, as in the case of the pharyngeal tonsil and in perhaps a less degree in the palatine glands, the lingual tonsil enters into a period of atrophic retrogression at the age of puberty. And further that in early adolescence, at the age of twenty years, the lingual tonsil ends by being reduced to some follicles of lenticular shape, so scattered as to represent complete atrophy. This view, which is also, I think, very generally adopted, is not only contrary to fact, but it is surely inconsistent with the remark of this particular observer, which again represents general knowledge, that chronic hypertrophic inflammation of the lingual tonsil is certainly one of the most interesting for practising laryngologists, for it is without contradiction the most common—and again that circumscribed inflammation of the fourth tonsil is observed almost exclusively in the adult.

My experience on this question, neither short, small, nor unobservant, has led me to state, in the forthcoming fifth edition of my treatise on diseases of the throat and nose, that, while it may be true that the lingual tonsil is equally well developed with the pharyngeal at early life, the difference between the lingual tonsil, and the pharyngeal, and the palatine is the circumstance that the first not only does not undergo an atrophic retrogression at puberty, but that it continues to grow while the others are relatively diminishing. Bickel indeed, in an able article in *Virchow's Archives* (1884) takes the view that the fourth tonsil, as the lingual double tonsil has come to be called, is less completely developed in childhood than are the faucial and

the pharyngeal. However that may be, it is exceedingly rare for the lingual tonsil to be hypertrophied before the age of puberty. The recorded cases of such a condition in the child are indeed very few—two only I think—and in one which occurred at the age of seven years, McBride, who reports it, states that there were no symptoms. The other case, that of Hickman, was congenital, and death took place shortly after birth from asphyxia directly referable to the growth.

Admitting with Swain, Schoede, and other anatomists, that the general structure of the whole tonsillar ring is histologically identical, there are certain important points of distinction to which my attention has been drawn by my colleague, Wyatt Wingrave, pathologist of our hospital. In the first place, it is quite common to find in the pharyngeal tonsil patches of honey-combed homogeneous colloid-looking substance enclosed in what is apparently the remains of a lymph-vessel, for these channels are for the most part much dilated. This substance is probably fibrinous in origin, the result of thrombotic changes. The reticulum itself also appears to be undergoing a similar degeneration. These conditions may reasonably be interpreted as indicative of a retrograde metamorphosis. They are never seen in either the faucial or lingual tonsils.

Another point is that the mucous and albuminous glands of Henle and Salter, only occasionally seen in the palatine tonsil and never in the pharyngeal, are notably abundant in the neighborhood of the lingual tonsil, it being exceptional not to find them. Moreover, below the lymphoid layer of the lingual tonsil, skeletal muscle-fibers are plentiful, and the cellular tissue is more dense than in the faucial.

A further point of anatomical distinction is the occasional presence of crypts in the lingual tonsil, lined with columnar ciliated epithelium, a peculiarity to which attention was first drawn by Wyatt Wingrave, and one not to be found in the other tonsils. The phenomenon is not perhaps of clinical interest, since it is of a purely vestigial nature.

It is again worthy of notice that such early observers as Kölliker, Luschka, and Lewin, have all drawn attention to the very superficial position of the veins at the base of the tongue, and I venture to question the accuracy of Escat's statement that they are invisible in the young child because they are hidden by the thick bed of lymphoid tissue, for such a reason does not hold good with the undoubtedly increased prominence of the veins of other

portions of the tongue with the advance of years, and, whether as obvious in the child as in the adult, the veins in this situation are *always* superficial. Nevertheless, it is doubtless true that varices of the veins at the base of the tongue may exist without overgrowth of the lingual tonsil, or even when it is atrophied, and that this varix constitutes of itself a diseased condition which gives rise to symptoms of such importance as to demand treatment.

The pathological bearing of the anatomical facts to which I have ventured to draw the attention of the Association is not a fanciful one. We can understand that not possessing the various evidences of a tendency to degenerate of which the colloid process is but one of those possessed by the pharyngeal tonsil, inflammatory diseases of the lingual tonsil are pronounced at periods of life when atrophic changes are as a rule complete in the pharyngeal tonsil and advanced in the palatine. For example, on the morning of the day on which I commenced to inscribe these remarks, I was consulted by a lady aged 72, on account of pharyngeal tenesmus—a term originated by me and now generally accepted. The symptoms were found to be due to a notable hypertrophy of the lingual tonsil, with marked varix.

The abundance of mucous and albuminous glands which we find in the lingual tonsil gives a higher degree of moisture to that region, and may account for the lessened disposition to acute inflammations of this structure, for not only does the careful collection of all the recorded cases brings very few to our knowledge, but, in our daily experience, phlegmonous, or even catarrhal inflammations of the lingual tonsil are surely of quite rare and exceptional occurrence. Nor do I think that it is common for us to witness infectious inflammations in the lingual tonsils. I cannot recall a single example in my experience in which diphtheria has selected that region as a *primary* site, and extension thereto is almost unknown. In the case of diphtheria, the membrane is seen to pass from the palatine tonsil by the faucial pillars to the sides of the epiglottis, and to creep round by the aryepiglottic folds into the larynx. As to scarlet fever, many cases may commence in the lingual tonsil and extend to the palatine, but I have not seen the reverse process when the palatine tonsils are the first to be attacked. Again, as I have witnessed it, syphilitic manifestations in the lingual tonsil are not common. It is surely not unreasonable to suggest that the comparative immunity to coccal and bacillary infection enjoyed by the lingual tonsil is due to the

greater flushing of this region by the abundant secretion of the mucous and albuminous glands.

The intense pain which is sometimes experienced in acute inflammatory conditions of the fourth tonsil is referable to direct stimulation of the glossopharyngeal nerve, whilst laryngeal symptoms, common to chronic hypertrophy, may be explained by reflex irritation of the fibers of the superior laryngeal nerve distributed to this area. In the close intimacy of the lingual tonsil with the muscular tissue of the lingualis—the essential muscle of the tongue—may be explained the impaired mobility of the organ when the lingual tonsil is acutely inflamed. It is not, indeed, at all straining the situation to point out that this muscular bed of the lingual tonsil differs considerably from the dense fascia on which the palatine tonsils rest and likewise from the osseous character of the greater part of the tissue underlying the pharyngeal tonsil.

A reference to the plates of Sappey enables us to appreciate the greater liability to concomitant adenopathy in inflammations of the lingual tonsil than is generally seen with the palatine and in the dense character of the cellular tissue, the comparative rarity of extension of morbid processes beyond the lingual tonsil itself.

Lastly, not to carry this point too far, may not the superficial and plentiful arrangement of the venous plexus at the base of the tongue account for the tendency to chronic hypertrophy and engorgement as a result of vocal abuse? For I do not think that either Holbrook Curtis or any one else who has written on this subject, has pointed out that chronic hypertrophy of this region, so common in singers and orators, is found for the most part in those who improperly use or abuse the voice.

Verneuil's statement that there is a deep as well as a superficial varix of the veins at the base of the tongue, and the anatomical observations of Zuckerkandl and Foucher that the lingual nerve is accompanied by a satellite vein, are of importance in relation to varix as a cause of *paræsthesiæ glossodynia* and other neuroses in this region.

Although not strictly within the scope of this short communication, it may be of interest to the Fellows of this Association to learn that so far from varix in this situation having been first written about and the condition described as one of "throat hemorrhoids" by so humble a person as myself, the subject was deemed worthy of clinical remark and even the term "hemorrhoids" employed so early as the fourth year of Practical Laryn-

goscopy by one of its first and most distinguished pioneers—G. Lewin of Berlin. At page 257 of his "Klinik der Krankheiten des Kehlkoffes," published in 1863, we find the following:

"Pharyngitis varicosa. This disease may cause bleeding. I may mention here the case of Dr. B. He suffered for many years from blood-stained sputum, with and without cough. He had consulted authorities of several universities. Finally, he sent to Geheimrat Frerichs who suspected the real source of the hemorrhage and addressed the patient to me. I found on examining him with the laryngoscope an injection of the mucous membrane of the lower posterior wall of the pharynx; this place was occupied also by some small varicose veins, which went in the direction of the larynx and esophagus. These varicose veins showed traces of recent bleeding.

"I may mention other cases, in men as well as women, who seemed to be affected with general plethora, and who said the cause of their trouble was "hidden hemorrhoids" (*versteckte hæmorrhoiden*). I found in the throat the following state: From the insertion of the epiglottis to the middle of the tongue a number of the injected, blue-reddish, elevated veins were seen which crossed the circumvallate papillæ. Some veins were found near the margin of the tongue, giving off small branches which terminated in small points of enlarged veins the size of a pin-head, the whole thing looking like 'grapes'. A number of these patients suffered from blood-spitting.

"In some of these cases, I saw in the fossa navicularis laryngis, parallel to the *plica crico-pharyngea,* a bluish-red vein as thick as a crow-quill. All these persons were healthy, except that they suffered from abdominal and hepatic plethora and their throat troubles."

These last, in 1865, Lewin more fully described as "sensations of scraping, burning, and dryness in the pharynx" (*kratzen, brennen, trockenheit*).

Lastly, I would say a word on the anatomical relations of a troublesome affection of the tongue—the imaginary ulcer—which it is true may arise from hypertrophy and varix of the lingual tonsil, but is quite as often due to slight mischief in another situation.

It is known that the taste-buds chiefly occur in the circumvallate papillæ. They are also to be found in the irregular nodular elevations constituting the lingual tonsils. But they also exist in the *"fimbriæ linguæ,"* two rough patches which are seen on each side of the tongue, just in front of the anterior faucial pillars.

Now these patches correspond morphologically with the *"papillæ foliatæ"* of the rabbit, and it is only in accordance with our general knowledge of vestigial elements, that this site should be prone to pathological processes.

PAPER:

REPORT OF TWO CASES ILLUSTRATING THE NEGATIVE VALUE OF TRANSILLUMINATION IN ANTRUM DISEASES.

BY H. HOLBROOK CURTIS, M.D.

Case I.—In 1895, a girl of 14 presented herself at my office, with a large adenoid in the nasopharynx and with impervious inferior meatus, the midddle meatus was filled with polypoid tissue completing the nasal stenosis. There was a marked prominence of the cheek-bone of the right side which I was informed had always existed. Transillumination showed no umbra over either antrum, and both orbits were illuminated. I removed the adenoid growth and partly freed the nostrils by curetting and trephining. Both inferior turbinates coalesced with the septum nasi, and a free operation removing the right turbinate only allowed a temporary relief of the stenosis of that side. In the spring of 1897, I did a second operation upon the right inferior turbinate making a free nostril. At the end of four months I saw the case and the stenosis was again complete on the right side. The friends of the patient stated that the prominence at the junction of the superior maxillary and nasal bone was less than formerly. I noticed, however, a small amount of exophthalmus, and consulted Dr. R. F. Weir who advised an exploratory incision, having found a prominence in the floor of the orbit. An operation was performed in December by Dr. Weir which revealed the right antrum to be filled with an osteoma which was intruding into the orbit and the right nasal fossa. The incision was made obliquely through the lip to prevent an elevating cicatrix; then along the junction of ala and cheek, and the latter was retracted to expose the entire anterior wall of the antrum. The wound, though extensive, healed externally by first intenion, and the antrum was dressed by iodoform-gauze plugs, removed through the opening in the region of the canine fossa.

The points which are to be considered in this case and which I want to impress upon the society are these:

1. An osteoma of exceeding slow growth was present in the antrum for a number of years, never evidenced by any subjective symptoms. The prominence of the superior maxillary had always been supposed to be congenital.

2. The fact that the left inferior turbinate was a bony hypertrophy obliterating the meatus, led me to overlook a unilateral involvement of the antra.

3. Transillumination was absolutely negative as a factor of value in diagnosis.

Case II.—A young lady was recently brought to my office by Dr. E. L. Keys, and Dr. Rhein, a dentist. A most severe neuralgia attributed to the teeth was present. A diagnosis of a neuritis of the inferior dental nerve had been suggested. Pain radiated to the ear, neck, and frontal region.

From the fact that the patient had recently had a severe attack of grippe, I questioned as to whether transillumination had been employed and was told that it had proved negative. I at once verified this by putting an eight-candle-power lamp in the mouth. From experience gleaned in several cases I, however, introduced an antrum catheter through the osteum maxillare and was as surprised as were the others to evacuate an antrum full of pus. I then operated and relieved the trouble by a week's irrigation.

PAPER:

SERIOUS CONSEQUENCES FOLLOWING INTRANASAL OPERATIONS.

BY ROBERT LEVY, M.D.

Case I.—J. S. C., male, æt. 30; medical student of very nervous temperament, was in my employ as stenographer more or less during the year 1896; during this time I became familiar with his past history. He had been a great sufferer from rheumatism, and as a consequence had become addicted to the use of morphine. This, he assured me, had been completely discontinued, and as proof showed me his arms, covered with old hypodermic scars. There was no history or evidence of syphilis or tuberculosis, although his general condition was rather poor, and at various times he had, in my office, attacks of cardiac distress, with pallor and rapid pulse, followed by extreme weakness. These attacks were attributed to excessive use of tobacco, there being no cardiac murmurs appreciable.

During the fall of 1896 patient complained of nasal discomfort, with some obstruction and occasional epistaxis. Rhinological examination revealed small cartilaginous septal spur and slightly deflected septum in left nasal cavity. Mucous membrane over spur was eroded, which, under proper treatment, readily healed. The septal irregularity was not sufficient to urge operation, the discomfort being considered more mental than physical. The patient, however, continually begged for relief by operation, especially after attending my clinics, until I finally removed the spur. Nothing eventful attended the course of the case.

In February, 1897, the patient being still greatly impressed with the presence of a deflected septum, prevailed upon me to operate for its correction. The Asch operation was easily and quickly performed before my class, February 5th, under cocaine anesthesia and proper antiseptic precautions. On account of the slight deformity, the operation was the simplest I had ever performed. The patient's nervous temperament was manifest immediately after the operation. It was with the greatest difficulty that he could be compelled to keep his fingers from his nose. The after-treatment was intrusted to my assistant, Dr. Meuer, and the patient ordered not to neglect reporting daily. This he did for

two or three days following the operation, after which neither my assistant nor myself saw him until February 13th. He had removed the Asch tube and had sprayed his nose with Dobell solution, using the atomizers in the office of an Eclectic practitioner for whom he was working. He presented the appearance of great depression; profuse perspiration on his forehead, skin moist, temperature 103° F., pulse 120; complained of intense headache and pain in both knee-joints. An examination of the nose revealed a large perforation at the site of operation, covered by dry greenish scabs. No purulent discharge nor injection of the mucosa was apparent. He was at once ordered to bed, given full doses of quinine and frequent nasal douches of warm boracic acid solution. The following day a slight improvement in temperature and pulse was noted, the pain in head and joints, however, remaining. Being unable to obtain careful attention where he was, he was sent to the Arapahoe County Hospital, February 15th. On admission the symptoms were as above, the physical examination revealing, in addition, mitral regurgitation. February 18th, A.M., patient became stupid, with slight paralysis of right leg. Toward evening delirium developed. At 5 P.M. Dr. Eskridge kindly examined the case, and found all deep reflexes slightly increased on right side, while superficial reflexes were absent. The tongue protruded well to the right, very slight difference in pupils, the left reacting somewhat better than the right, no retraction of the head, almost complete motor and sensory paralysis on the right side. Diagnosis: Thrombus, which was verified at the autopsy. February 20th, stupor more profound, right pupil smaller than left, paralysis of right side complete, muttering delirium, death at 5 P.M.

Necropsy, performed by Dr. Axtell eighteen hours after death. Rigidity and staining fairly well marked. In the extremities, at joints, about the distribution of smaller arteries, several hemorrhagic infarcts are observed beneath the skin; on the arms and chest evidences of old hypodermic abscesses are seen, while over left leg is observed a recent abscess covered with a brown scab. Upon lifting the calvarium no evidence of meningitis is detected, nor can any trace of meningeal inflammation be discovered anywhere. Section of brain reveals entire left optic thalamus and posterior part of internal capsule broken down and softened. The softening extends from median line to extreme outer border of optic thalamus. At the first bifurcation of posterior cerebral artery there is found evidence of arteritis and plugging. Right

lung is found slightly emphysematous; left pleura contains many old adhesions. There is endocarditis, universal pericarditis with adhesions, the aortic valves are very thick, the spleen and liver are found large and soft and contain many infarcts. The cause of death is general septicemia, thrombus of the posterior cerebral artery, and cerebral softening. The thrombus is evidently due to syphilitic arteritis, in spite of the non-syphilitic history. The endo- and pericarditis are plainly recent, and are responsible for the infarcts in the liver and spleen. Whether the hypodermic abscess on the leg, or the wound in the nose, is responsible for the endo- and pericarditis is an open question, and one which I shall not attempt to decide.

The serious sequence of events following the septal operation is sufficient to recognize the close relation which may be assumed to exist between the two.

Case II.—This interesting case occurred in the practice of my friend, Dr. W. W. Bulette of Pueblo, Colo., through whose courtesy I am permitted to briefly report it. Miss M., æt. 25, consulted Dr. B., March 6, 1897. There is a family history of phthisis and asthma.

Patient has always been delicate and of nervous temperament. Has had diseases of childhood, suppuration of both ears, grip in 1893 and 1894, tonsillitis, colds in the head, and has been a mouth-breather for years. In April, 1894, she developed so-called cottonwood fever, which in all symptoms resembles hay fever and lasts until June 15th of each year. Rhinological examination shows hypertrophic rhinitis, large exostoses adherent to septum, middle turbinates and vault of nares on both sides; follicular pharyngitis. March 26th Dr. B. removed the right exostosis under cocaine and asepsis. Good recovery. April 3d, left exostosis removed under similar precautions. Treatment preparatory to operations consisted of antiseptic spray from March 6th to March 26th. After-treatment consisted of cleansing, followed by spray of 10 per cent. solution of antipyrine, followed by packing of iodoform gauze saturated with 10 per cent. solution of tannic acid, which was retained for twelve hours. April 5th patient developed symptoms of cerebral meningitis, and died on the 7th. No autopsy.

In presenting this communication it is not the author's intention to elaborately analyze or comment upon the dangers which may follow operations in the nose. To this honorable, well-posted, and thinking body of rhinologists such a course would be

but tiresome and useless. The mere relation of these two cases is sufficient to direct your thoughts in the channel which mine have taken, and cause you to arrive at similar conclusions.

Many words of warning have been and are still heard against unnecessary, injudicious, and severe intranasal measures. The paper of Professor J. Solis-Cohen[1], and the discussion which followed its reading in 1885, have been of inestimable value to rash and impetuous youths in the profession, and though Rice states that "the patient's life is rarely endangered," the tenor of his paper on "Antiseptic Nasal Surgery"[2] is a note of warning. Dr. Hobbs[3] puts it very strongly when he says: "While judicious and properly executed rhinal operations have done and are doing an immense amount of good, for this very reason the temptation is increased in many instances to do operations that were better not done, particularly by the younger men just making their entrée into this special line of work. They are loath to allow an opportunity to pass to saw a septum, to drill an exostosis, or to cauterize a protuberance or an enlarged turbinate. The mere suggestion of a septum spur, or a bony protuberance, or an enlarged turbinate, is too often deemed a sufficient reason for a surgical procedure, even though no subjective or objective symptoms may exist."

A great variety of accidents may follow intranasal operations. Lermoyez[4] divides them into three classes: First, infectious; second, nervous; third, mechanical. The commoner symptoms of malaise, fever, myalgia, etc., are well known. Remarkable and unusual after-effects have been reported by reliable observers, among which we find septal abscess by Lederman[5] and Mayer[6]; loss of memory, spasmodic cough, by Thorner[7]; amaurosis, by Thorner,[7] Packard,[8] and others. A peculiarly interesting instance of pyorrhœa alveolaris is reported by Dr. Bottome[9] of New York; one of prolonged hysterical manifestations by Luzatti,[10] and one of tetanus after tamponning, by Arcangelli.[11] Treitel[12] asserts that he has *rarely* observed infectious sequelæ after operations in the nose, and that *never* have serious infectious processes followed. On the other hand, the following cases represent not all, but probably the most noted ones which have been reported and in which death has supervened:

K. Stork.[13] Case of meningitis following curetting for chronic purulent rhinitis; death in three days; observed in 1860. Five cases of purulent rhinitis followed by meningitis.

Löcherer.[14] Death following curettement in case of nasal polypi.

Wagner, R.[15] Meningitis and thrombosis of longitudinal sinus after galvano-cautery to middle turbinate; hemorrhage, tampon, death thirteen days after operation.

Lange, V.[16] Probably sinus thombosis after galvano-cautery for bony and membranous occlusion of right nasal fossa; death six days after operation.

Rayser.[17] Meningitis after removal of polypi by snare; empyema of antrum of Highmore; death in eleven days after operation.

Broechaert, J.[18] Meningitis of right temporal lobe and falx cerebri after operation for polypi by galvano-cautery; death twenty days after operation.

Rethi, L.[19] Meningitis, thrombosis, pyosepticemia, hemorrhagic and purulent nephritis, purulent inflammation of joints after several operations for nasal polypi; hemorrhage, tampon; death five days after last operation. This author refers also to cases of Voltolini and Lublinski.

Quinlan.[20] Meningitis after electro-cauterization of middle turbinate. Author also mentions a case by Baruch in which fatal results followed a sawing operation.

Leplat[21] reports an interesting case in which death occurred, presumably from meningitis, following the forcible probing and injection of the lachrymal canal.

Destot[22] relates a case which has an intimate bearing upon the subject under consideration. A man 46 years old had an acne pustule on his left ala nasi, which he frequently opened by scratching. After a cold he became seriously ill and died. The autopsy established the cause of death as thrombosis of the ophthalmic veins and cavernous sinus directly traceable to the acne.

Meningitis, sinus thrombosis, and death are not infrequent accompaniments of purulent affections of the nasal accessory cavities, and in some instances in which operations were undertaken for relief of empyemata it has been difficult to decide the relative rôle played by the disease and the operation. Flatau seriously questions whether death in his case was due to operation or to a latent meningitis.[23] Würdemann[24] reports an instructive case in which there occurred alarming septicemia, with maxillary, ethmoidal, and sphenoidal abscesses, followed by recovery after appropriate surgical treatment.

In speaking of the causes of meningitis, Collins[25] lays stress

upon operations of the cephalic extremity, including the nose, and upon pyogenic diseases of the adjacent cavities. In phlegmonous inflammations of the nose he states that the veins form the pathway for infectious material. Ziem[26] also speaks of the nose as the entrance for infectious conditions. That a direct communication may exist between the subarachnoid space and the lymph spaces in the nose has been shown by Flatau[27]; and Heubner[28] has reported a case in which the meningo-cocci were found in the nasal secretion of a meningitic patient. A knowledge of the close relation between the nose and cranial cavity would deter many from intranasal operations were it not for the wonderful investigations of such men as Piaget, Thomson, and Hewlett, Wurtz and Lermoyez, Wright and Park, and others. While all observers are not entirely agreed, the fact seems fairly well established that the nasal secretion is sterile and even possessed of some bactericidal properties. On the other hand, it is interesting to note that, as Gradenigo[29] has pointed out, a difference in the character of discharges between normal and diseased noses must exist, and that non-pathogenic germs may, under altered conditions, become pathogenic (McIntyre[30]). An exceptionally important conclusion is the one arrived at by nearly all observers, namely, that the source of contamination is in the vestibule.

This is of the greatest practical value, and furnishes the keynote to all that may be said on aseptic and antiseptic nasal surgery. In addition to the exercise of care in introducing infectious bacteria from the vestibule, the greatest stress should be laid upon perfect surgical cleanliness of the surgeon's hands and instruments. Elaborate pre-operative or post operative manipulation is not only unnecessary, but harmful. The postnasal syringe or the nasal cup are far better than atomizers to cleanse the nose; washing from the nasopharynx avoids the possibility of infection from the vestibule, while it destroys no epithelial cilia, which are important in establishing a free flow of nasal secretion.

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[30] *Ibid.,* p. 457, Sept., 1893.

PAPER:

TREATMENT OF CHRONIC EMPYEMA, MAXILLARY SINUS.

BY J. A. STUCKY, M.D.

So much has been written upon this subject that it may seem superfluous at this time to again bring it before you for consideration. That empyema of the nasal accessory cavities, especially the antrum of Highmore, is far more frequent than is generally supposed, and as frequently overlooked, I think "may go without saying." Failure to relieve many of our so-called "old catarrhal cases," after we have removed all visible obstructive and diseased tissue in the nasal and pharyngonasal cavities, is due to not recognizing suppurative and other pathologic conditions in the accessory cavities. Empyema of the maxillary sinus is caused most frequently by dental caries, and the removal of a dead tooth that penetrates the cavity usually gives prompt relief, unless the suppurative process has continued long enough to result in caries and granular or polypoid degeneration of the lining intracellular membrane.

The cause which interests us most is that which comes from the nose, or infection in the frontal or ethmoidal sinus. Atrophic rhinitis or ozena may be a possible cause of suppuration of the antrum by infection or infiltration through the ostium maxillare. In five of my cases where marked atrophic trouble existed, with shrunken and degenerated (polypoid) middle turbinate, with no dental caries or evidence of suppuration in any of the other accessory cavities, the antrum was full of pus and granulations. In these cases I am at a loss to know to what to attribute the empyemic condition, unless it be the infection from the mucopurulent secretion from the nasal cavities. Another probable cause is the damming up of the ostium maxillare by nasal polypi or enlarged middle turbinate, the retained secretion undergoing such a change as to result in irritation, inflammation, and suppuration.

The symptoms of this trouble are frequently undefined and misleading. Very little attention is drawn by the patient to the cheek. The pain most complained of is in the back of the head and the supraorbital and temporal region. I need not emphasize the necessity of a very careful examination in order to make an

accurate diagnosis. Tapping sharply with a heavy probe the first, the second, and the canine teeth, will cause pain if the suppuration is extensive or if there is dental caries. Transillumination is frequently a great aid, but is by no means certain. When in doubt, the exploratory puncture with trocar and cannula or small burr attached to a dental engine, will settle the question beyond a doubt.

In the treatment of these cases our first attention should be directed to the nasal cavity. If there be any obstruction to free drainage or respiration, it should be removed. If the middle turbinate is so enlarged as to encroach upon the middle meatus, or enough to interfere with the ostium maxillare, the anterior portion should be removed. In the majority of cases I have found this operation of turbinectomy to be of greatest value. If the ethmoid cells are involved in the suppurative process or have undergone a polypoid degeneration, these should be thoroughly dealt with, and the same may be said of the frontal sinus. Sometimes we find the maxillary sinus filled with pus and granulations, with no symptom of frontal or ethmoidal disease, but a close examination often reveals trouble in one or both of these—more frequently the ethmoid.

Having attended to the nasal cavity, the operation upon the maxillary sinus is performed in the following manner: If necessary, the second molar is extracted, and with Buck's mastoid drill a large opening is made through the alveolar process into the antrum. With a sharp-edged bone spoon the opening is made smooth, and shaped to admit the introduction of a medium or large-sized ear-speculum, so the cavity can be illuminated (with head-mirror) and thoroughly examined. If granulations, polyps, necrosis, or caries exist, Myles' curettes are used to remove all diseased tissue. After this is done the cavity is thoroughly irrigated and loosely packed with iodoform gauze. The first dressing is not removed for forty-eight hours, unless elevation of temperature and throbbing pain indicate the necessity for so doing. After the removal of the first dressing the antrum should be irrigated daily, the opening and drainage maintained by a tampon of sterilized or iodoform gauze. I think that in many cases, where a large opening is made, and the cavity thoroughly cleaned and drained, spontaneous healing takes place "by the filling up of the antrum with connective tissue." The nasal cavities should be cleaned with alkaline antiseptic spray, anteriorly and posteriorly.

Of the cases which I reported at the meeting of the Kentucky

Medical Society in 1896 (*American Practitioner and News,* June 27, 1896), all remain free from antral trouble, and I desire to emphasize the superiority of entering the antrum through the alveolar process, rather than the canine fossa. By the latter procedure, in order to make an entrance sufficiently large, we are liable to split the thin bony (external) wall, leading to prolonged and painful complications. The tendency of the soft parts of the cheek to overlap and close the opening seriously interferes with drainage and is a source of constant annoyance and irritation to the patient. A counter-opening through the inferior meatus to facilitate drainage, I have never found necessary, and do not think it advisable. The gauze drainage has proved far more satisfactory to me than either metal or rubber tubes.

PAPER:

PERICHONDRITIS AND NECROSIS OF THE ARYTENOID CARTILAGE.

BY W. SCHEPPEGRELL, A.M., M.D.

Perichondritis of the arytenoid cartilage is due, in the majority of cases, to a tuberculous process in the larynx, although it may also follow syphilitic inflammation, typhoid fever, and malignant processes; occasionally diphtheria and traumatism result in perichondritis.

Of thirty-two cases of perichondritis of the laryngeal cartilages collated by F. Bosworth ("Diseases of the Nose and Throat," Bosworth, 1892), from which laryngeal cases were excluded, nine were due to syphilitic lesions, eleven followed enteric fever, one each from diphtheria and traumatism, two in which lordosis of the cervical vertebræ was probably reponsible for the inflammatory process, and nine were of the so-called "idiopathic" type. Of these cases, twenty-three involved the cricoid, four the arytenoid, three the thyroid, one the cricoid and thyroid, and in two cases all the cartilages of the larynx were involved.

Schroetter (*Wien Klin. Woch.*, 1888) considers the arytenoid as the most frequently affected, this probably excluding tuberculous lesions. In collating fifty-five cases of perichondritis following typhoid fever, Lüning (*Archiv f. Klin. Chir.,* vol. xxx) found the cricoid cartilage involved in twenty-two, the cricoid and arytenoid in fourteen, the arytenoid in nine, the thyroid and cri-

coid in five, the thyroid, cricoid, and arytenoid in three, and the thyroid in two cases.

Flormann ("Von einer in Vereiterung uebergehenden Halsentzuendung, Sammlung auserlesener Abhandlungen," Leipsic, Bd. xiv, 1891) reports three cases in which the excessive use of the voice was the etiological factor.

In the majority of cases, however, perichondritis of the arytenoid is due to a tuberculous process, the ulcers usually developing on the posterior part of the larynx. When the mucous membrane over the arytenoid cartilage takes part in the pathologic process, the perichondrium may be destroyed and the cartilage exposed. Necrosis, therefore, is a natural consequence. It is not always easy to make the diagnosis by the laryngoscope or the sound, but arytenoid perichondritis may be suspected in tuberculous laryngitis when there is a chronic inflammatory edema of the tissues surrounding the arytenoid cartilages and those of Santorini and Wrisberg.

A point of strong diagnostic importance is the immobility of the arytenoid cartilage taken in connection with the pathologic signs already described. Paralysis is easily excluded, and a careful examination and history of the case will exclude extensive mucous exudation, etc. When the inflammatory process around the arytenoid cartilage is sufficiently prominent there is difficulty of deglutition and often dyspnea, the former being more marked, as the inflammatory swelling of the mucous membrane is usually more prominent on the posterior side of the arytenoid and less so on the anterior. The *sinus pyriformis* of the affected side is diminished in area, this being sometimes quite marked.

In the more acute cases of perichondritis of the arytenoid cartilage an abscess is formed, the discharge usually taking place in the neighborhood of the *processus vocalis*, although not infrequently at the extremity of the arytenoid cartilage or through the pyriform sinus. In chronic cases, this result may be retarded or even absent, this being especially the case in syphilitic conditions where the pathologic process sometimes improves rapidly under operative treatment. Several cases of perichondritis of the arytenoid are well illustrated in the "Clinical Atlas of Laryngology," by Jno. Schnitzler, 1895.

When anchylosis develops, there is hoarseness which may extend to the point of aphonia. There is usually considerable irritation in the throat, not only from the pus-formation and swelling, but also from the effects of the inflammatory swelling on the oppo-

site side of the arytenoid. In a case in my practice, the exposed part of the necrosed cartilage caused an ulceration of the opposite arytenoid from friction and irritation.

Where there is necrosis, several months are required for the exfoliation, which is usually effected through the natural passages. In the majority of cases of perichondritis of the arytenoid cartilage, a permanent anchylosis of the crico-arytenoid articulation results, causing considerable vocal impairment. Necrosis follows in the large majority of cases. When one arytenoid cartilage has been eliminated, the soft tissues which it supports collapse, and the median line is drawn over to the diseased side. The healthy arytenoid and vocal cords, however, tend to compensate for the defective parts, and, in some cases, to such an extent that the voice remains fairly good.

The following case of necrosis of the arytenoid cartilage is interesting for several reasons: the persistent elevation of temperature for years, without the exhibition of any tuberculous process except the perichondritis of the arytenoid cartilage; the non-development of other tuberculous symptoms; the recovery of the patient with unaffected voice.

Miss L. B., age 33 years, applied August 20, 1892, at the Eye, Ear, Nose, and Throat Hospital. The patient's voice was husky and she complained of pain in the thyroid region and of much difficulty in swallowing: her temperature was 101.5°. A laryngoscopic examination showed defective movement of the left arytenoid, and a projection at its posterior extremity which subsequently proved to be the necrosing arytenoid cartilage. Palliative measures were at first used, but the case became progressively worse, and, as the patient was becoming emaciated on account of the difficulty of swallowing, I decided to remove the projecting cartilage by means of the cold snare. This was successfully done, and a histologic examination showed the piece extracted to be the necrosing cartilage.

This operation was followed by considerable improvement in the symptoms of the patient, and an ulceration, which had developed opposite to the diseased area from the mechanical irritation of the rough projection of the necrosing cartilage, now yielded to the application of lactic acid.

The site of the operation now began to develop excessive granulations, and six weeks later these had developed to such an extent that they caused serious disturbance in speech and deglutition, and the pain was again considerable. An examination with

the probe gave no evidence of any further necrosis. The cold snare was repeatedly applied, but each time the granulations recurred.

With a view to effecting a radical cure, the electro-cautery was now used and the diseased tissue carefully extirpated by means of a pointed laryngeal electrode. The patient had now become accustomed to these endolaryngeal manipulations, and, after the parts had been thoroughly anesthetized by a five-per-cent. cocaine spray, the application was made without great difficulty.

This time the result was satisfactory. The parts continued to heal and two months later had entirely cicatrized. The left arytenoid cartilage had become shortened, so that the ventricular band prevented the vocal cords from being seen except on strong phonation, but there was no infiltration or pain and but little fatigue in speaking. The defective movements of the left vocal cord were compensated for by the increased action of the right, so that the speech was unaffected.

On October 11, 1894, the patient had gained five pounds and was greatly improved in appearance. There was still an elevation of temperature of one or two degrees daily. By a laryngoscopic examination, the deformity due to the shortening and fixation of the left arytenoid cartilage could be clearly seen, but there was no pain or discomfort in speaking or swallowing. The laryngeal condition in this case appeared to be due to a tuberculous infection, this theory being supported by the family history and the continued elevation of the temperature, but it could not be corroborated by a bacteriologic and physical examination, as these always proved negative.

A most interesting feature in this case is the continued elevation of temperature. The patient has been under my observation for six years, and although her health is fairly good and she complains of no discomfort with the throat, the appetite and weight have improved, and a physical examination has at no time revealed any pathologic condition in the chest. I have never yet seen this patient with a normal temperature. It varies from 99° to 100.5°, and, at one time when I gave the patient a thermometer and requested her to register her temperature twice daily, it never varied from this peculiarity. Various medicines have been given her without effect, the best results, however, being obtained from arsenical preparations. There is, no doubt, some focus of irritation in the system of the patient and probably of a tuberculous

nature, but urinalysis and repeated physical examinations have failed to locate the spot.

The permanent removal of the granulations with the electro-cautery, which the successive applications of the cold snare had failed to do, is an interesting point in this case. I call attention to this circumstance as some authors not only do not advocate the electro-cautery in the larynx, but actually warn against its use. Lennox Browne ("Throat, Nose, and Ear Diseases," Lennox Browne, 1893), for instance, expresses his opinion in the following words: "While without the galvano-cautery in diseases of the nose, pharynx, mouth, and tongue, I should feel deprived of at least one-half of my power to help the conditions for which I use it, I have a strong conviction that were I to employ it in such regions as the larynx below the glottis, to the pharynx below the same level, or to the esophagus, I should introduce into my practice a new and grave element of danger."

Other laryngologists, however, have had good results from the application of the electro-cautery in the laryngeal cavity, and this has also been my experience with this method. I have used it successfully in several cases of neoplasms of the larynx as well as in the case here reported, and at no time with unpleasant complications due to the use of the electro-cautery.

The application, however, requires considerable manipulative skill, and the difficulties are far greater than when the electro-cautery is used in the nose or pharynx. The cautery-point itself should be light so that it may be brought to the required degree of heat almost instantly and cooled as quickly; this is essential, as otherwise a spasmodic contraction of the throat of the patient may inflict injury on the adjoining parts. The current should be controlled by means of a foot-switch, as the contact-button in the handle interferes with the delicacy of manipulation.

The patient should also first be trained for the manipulations required, which will probably be necessitated by the ordinary treatment of the case. In some patients, the irritability of the throat is such that the electro-cautery or other operative measures cannot be effected through the natural passages. With patience, perseverence, and proper manipulative skill, however, the majority of these cases may be treated without resorting to graver external methods.

PAPER:

A NASOPHARYNGEAL POLYPUS OF ENORMOUS SIZE.

BY MAX THORNER, M.D.

Nasal and nasopharyngeal polypi of more than average size are occasionally encountered, but the specimen of polypus here presented, which was taken from a patient on April 23, 1898, is of such unusually enormous size that I present it on this account.

The patient, a white man, thirty years old, was admitted to my service at the Cincinnati Hospital, his complaint being inability to breathe through his nose, fulness in the head and deafness and continuous roaring noises in the ears. This annoyance had existed for several years, and was first noticed some seven or eight years ago. He stated that he had been operated upon several times, the last time at Washington, D. C., about one year before, when a tumor had been removed piecemeal from his throat, but not very long after the operation the obstruction again made itself felt.

The patient had the characteristic expression of a mouth-breather. Hearing was very much diminished, and the voice had the characteristic nasal twang. Upon examining the throat a large polypoid mass of grayish color and glistening surface about the size of a pigeon's egg could be seen protruding below the right side of the soft palate. The soft palate itself was immovable during phonation and was undoubtedly pushed forward. Upon lifting the palate with a palate-hook, which could be very easily done because the mucous membrane was apparently obtunded, it was seen that enormous white masses of irregular size filled the entire postnasal space. The site of origin of these masses could not be made out, but it was apparent that it was somewhere on the right side of the pharynx. The left nasal fossa was free, but the right fossa was filled posteriorly with the same polypoid masses. I was under the impression that I had to deal with several polypi, and expected to remove them one after another.

On April 23d I operated upon the patient in the presence of the internes, Drs. McKee, Iglauer, and Dean, under cocaine anesthesia. I introduced a cold-wire snare behind the soft palate, and pushed it up as far as possible over the polypoid masses.

After some difficulty I succeeded in extracting this enormous mass of polypoid tissue, and found to my utter astonishment that I had removed the entire growth, which represented one large polypus, consisting of many large and small lobules. Some of these lobules were of the size of a small hen's egg. (The illustration does not convey an exact idea of the specimen as it was made after the latter had been in a solution of formaline for some time and had become hardened and somewhat contracted.) The tumor was attached by a slender pedicle of the diameter of a thin

Exact size of nasopharyngeal polypus removed from the patient.

lead-pencil to the right lateral wall of the pharynx just in front of the orifice of the Eustachian tube, and after the operation the bleeding-point of its insertion could readily be seen with the aid of a rhinoscopic mirror. The right nasal fossa, of course, was free after the operation, as the mass which had been seen in its posterior portion was but a part of the polypus.

The growth is a so-called mucous polypus, which, as we know now, is nothing but a fibroma œdematosum, and, though located

in the postnasal space, must not be confounded with a nasopharyngeal fibroma, which usually takes its origin from the periosteum of the basilar portion of the occipital bone and the anterior surface of the upper cervical vertebræ. There is little doubt that this polypus originated in the posterior portion of the right nasal fossa near the choana, and that by reason of its location and weight it decended into the postnasal space, where the conditions for its unusual development were very favorable. The hemorrhage following the operation was insignificant. The largest diameter of this tumor is 2¾ inches, its greatest thickness 1⅜ inches, and its weight 1 ounce, 5 drams.

I have been unable to find a record of a postnasal polypus of similar size.

NOTE.—No recurrence had taken place up to December 22, 1898, eight months after the operation, when the patient presented himself again for reexamination.

DISCUSSION.

Dr. E. W. DAY, Pittsburg: I would like to report a case of nasopharyngeal sarcoma, in which the results were not good. The patient, a boy, H. L., aged fourteen years, died from the effects of the operation. When he first came to my office there was marked protrusion of the right eye-ball and cheek. A mass was protruding from the right nostril. The history given by the patient was as follows: Two years previous there had been some trouble in the right antrum which had been treated by a dentist with all appearance of a cure. The following year a growth was observed to block the right nostril, and an attempt at removal was made by a physician which resulted in a very copious hemorrhage that was with great difficulty controlled. A small section of the growth protruding through the nostril was removed for microscopic examination and a diagnosis of round-cell sarcoma was made. As death was inevitable in any case, the father gave permission for an operation, and the tumor was removed by excision of the superior maxillary. The growth had two attachments, one broad and firm attached to the basilar process of the body of the sphenoid, the other thin and ribbon-like coming from the antrum. When the growth was torn loose from these attachments a very copious hemorrhage of venous blood resulted. The hemorrhage was controlled very quickly by packing the cavity with pledgets of gauze: but in this short space of time an immense amount of blood had been lost and the shock to the patient was very great. Free stimulation and intravenous injections of a large quantity of the normal salt solution were used without effect, and the patient survived but a few hours after the operation. The growth was quite large, some eight inches in cir-

cumference and heart-shaped, with the apex at the nose. In the right nasal fossa, the turbinates disappeared from pressure, and the antrum was almost obliterated from pressure on the inner wall. Extending through the center of this growth was a very large venous cavity admitting the small finger, which led direct to its attchment at the sphenoid and had almost direct connection with the cavernous sinus at the base of the brain. The excessive hemorrhage had come from this large cavity.

Dr. Robert C. Miles, New York: These cases do not occur often, but when they do come they afford a series of interesting consequences. A few years ago a man applied, sent by a general surgeon for an opinion concerning an antrum trouble. He had been operated upon by a general surgeon and by a dentist. The diagnosis of a malignant growth was made. I removed a specimen which Dr. Pruden pronounced a sarcoma. Dr. Wyeth removed the superior maxillary bone and an artificial jaw was inserted. With the exception of a rather disagreeable metallic taste in his mouth, due to metallic association, the patient is doing very well. Last year I operated on a woman fifty years of age for a growth in the left tonsillar space which three pathologists pronounced sarcoma: the fourth was not certain. It also extended into the muscular tissue—a very unfavorable symptom. The growth was removed. That was something over a year ago and the woman at the phesent time is entirely well. I think if the case had progressed for a short time longer, perhaps for a month or more, it would have been beyond recovery. Some pathologists claim that the cases of recovery could not have been sarcoma, and that it is sometimes difficult to distinguish between a benign and a malignant tumor.

Dr. Price Brown, Toronto: I had a case of this kind to report at Baltimore three years ago and I speak of it again to-day because the man is still alive, without any return of the disease. This was the case of a young man, 19 years of age, who had had what was supposed to be sarcoma and had been operated upon several times with excessive bleeding, but there was a rapid recurrence after each operation. Pathological examinations were made and the disease was pronounced round-cell sarcoma. He was advised to go to Baltimore, which he did, and the final operation was performed in one of the hospitals there. He recovered, and came back to Toronto. About a year afterward he came to me, and, upon examination, I found a large, solid, hard growth in the right nasal passage. It was about half way back and sessile, and seemed to be growing from the septum vault and the external side. He was bleeding considerably at the time, and I saw an operation must be done soon, and that it could not be operated on with a snare. I used the cautery. The first time it caused considerable bleeding and I plugged the nostril. At the second operation, two days later, the hemorrhage was immense. I had to get professional assistance to stop it. I then used electrolysis, passing one needle through in front and the other behind the soft

palate, both of them penetrating the tumor. The séances were continued as long as the patient could bear the pain, and were repeated several times at intervals of one or two days. This had the effect of removing or lessening the amount of the mass, but it became less red in appearance. It practically limited the blood-supply. I then again used the galvano-cautery as before. There were a number of operations—perhaps twelve or fifteen sittings in all. Finally, the whole of the growth was removed. All the operations were done under the influence of cocain. Twice I had microscopic examinations made of sections. These proved it to be fibroma.

Dr. Wendell C. Phillips, New York: Mr. President and Fellows, I have only a word to add, and that is to emphasize the point that the growth which I removed seemed to be made up of epithelial cells ingrafted upon the surface of a mucous polypus in the antrum of Highmore. The literature on this subject is very meagre. It is impossible to gain very much information from books or published cases. It is a matter of speculation as to how or where these growths originate. If this was true, primary epithelium, ingrafted upon the surface of a mucous polyp, it goes far to prove that benign growths may and often do become malignant.

Dr. Thomas H. Halsted, Syracuse, N. Y.: About three years ago a man of 55 years consulted me because of an exophthalmos of the right side. The eye was pushed upward and outward. There was pain over the antrum and some swelling. On examining the nose, clear yellow pus was seen coming from under the middle turbinated body, and quite a large mucous polypus, originating apparently from the region of the hiatus semilunaris. Transillumination showed the right antrum and pupil perfectly dark, the left translucent. He gave a history of an ulcerated tooth, with antral suppuration following, dating back eight years. I diagnosed empyema of the antrum, and opened through the alveolus, finding comparatively little pus, but the antrum filled with a red, friable mass, which under the microscope was shown to be carcinomatous. The microscopical examination showed it to be a simple mucous polypus, non-malignant. The point I desire to make is this: Had this polypus been removed say before the exophthalmos appeared and before the malignant disease of the antrum was discovered, the case might have been looked upon as a benign growth undergoing, after operation, malignant change.

At the last meeting of this Society I reported a case of naso-pharyngeal sarcoma in a child fourteen months of age.

PAPER:

OTHEMATOMA AND CHRONIC PERICHONDRITIS OF THE AURICLE.

BY JOHN O. MC REYNOLDS, B.S.C., M.D.

The object of this paper is to briefly report two illustrative cases of two similar affections which, in my experience, have been exceedingly infrequent, and judging from the very few recorded cases in literature, my own observation has been no exception to the rule. Indeed, my purpose will in great measure be accomplished if the recital of my own cases shall succeed in calling forth the reports of similar unpublished data that will lead to a more thorough knowledge of these conditions with regard to their causation, pathology, clinical history, and treatment.

The first case which I shall describe is one at present under my care, and it exhibits the characteristic features of a chronic perichondritis of the auricle of traumatic origin. The patient, Mr. L. W., twenty years of age and of a good history as to general health, was thrown from a bicycle during a race in Kansas on August 5, 1897, and received a slight wound of the upper portion of the auricle near its attachment. The wound was dressed without due regard to the established aseptic methods, but it healed after a few days so that the patient was led to expect no future trouble. There soon developed in the upper part of the pinna a moderate swelling which gradually extended downward, until finally, after the lapse of a few months, the entire cartilaginous structure of the ear became involved, resulting in an enormous enlargement of the ear in all diameters, with complete closure of the external canal. The tumor was dark red in color, nodulated in form, very painful upon pressure, somewhat elevated in temperature, and presented its greatest prominence on the anterior surface of the ear: obliterating, first, the fossa of the helix, and subsequently also the fossa of the concha, and later still the external meatus. The auricle was increased to many times its normal diameter, and it stood out from the head after the fashion suggested by the comic pictures of the "Yellow Kid." There were no constitutional manifestations worthy of note, and the patient was never compelled to surrender his accustomed vocation. At one time, the inflammation was so intense and so ex-

tensive that it suggested the danger of erysipelas, and appropriate treatment was instituted to prevent such an occurrence.

Without entering into the details of the management of the case, I will briefly refer to those measures which, in my judgment, were most efficient.

The medical treatment consisted in the administration of the tincture of the chloride of iron, the liberal use of the iodides internally, and the local employment of antiseptic solutions, followed by applications of a glycerine solution of iodine and the iodide of potassium. The surgical treatment consisted in aspirating the subperichondrial space, which resulted in securing a certain amount of bloody serum without producing any change in the size of the tumor. This was followed by very liberal incisions throughout the regions involved, in order to facilitate the thorough removal with a curette of all the morbid material between the cartilage and the perichondrium. The wounds were kept well drained by antiseptic gauze, carefully introduced every day by my assistant, Dr. D. E. Seay. This material was examined very carefully by Drs. Shelmire and Smart of Dallas, and also by Dr. Brooks of New York, and it was found to be composed of elements entirely similar to that of a small round-celled sarcoma or granulation tissue. The following is the report of Drs. Shelmire and Smart:

"DALLAS, TEX., December 22, '97.

"DR. J. O. MCREYNOLDS, DALLAS, TEX.

"DEAR DOCTOR: The growth sent for examination is composed chiefly of granulation tissue, in some portions infiltrated with pus-cells—inflammatory. In many places, covering large areas, there are hemorrhagic deposits. Some sections show the perichondrium separated from the cartilage by these effusions of blood. Both cartilage and perichondrium show inflammatory changes. While there are some portions which are suspicious of a sarcomatous nature, we are inclined to the opinion that the growth is benign.

"Respectfully,

"DRS. SHELMIRE AND SMART."

The gradual and protracted progress of the trouble, together with the microscopic examination, might arouse the suspicion of a malignant growth, but the other characteristic clinical features of the disease were sufficiently clear to justify the diagnosis

and treatment of chronic perichondritis of the auricle, instead of the graver prognosis and more radical procedures belonging to sarcoma. And thus we shall be able to save, with very little deformity, an ear which otherwise might have been sacrificed without cause.

Since writing the preceding for publication the case has confirmed the diagnosis by a complete recovery, with slight deformity.

The second case, Mrs. H. of Terrell, Tex., presented considerable interest. The ear first became involved while on a visit in Fort Smith, Ark., in August, 1893. It began with swelling and intense pain in the external auditory canal. It developed in connection with acute rhinitis, and this fact, together with the severity of the pain, led the patient to suspect otitis media. But the pain, in a few days, subsided, without any discharge of any kind from the ear, leaving the patient, however, entirely deaf in the affected ear. She then returned to her home in Terrell, Tex., and was seized with a second attack, more severe than the preceding. She called in her family physician, who lanced the ear repeatedly, from time to time, without producing any marked relief, and without reaching any distinct purulent accumulation, but only a slight amount of yellowish fluid mingled with blood. The tissues below and in front of the ear appeared soft and swollen, so her physician, who is a very competent man, lanced in this situation also, without the desired result. From this latter wound there developed a kind of fistula, which communicated with spaces within the substance of the auricle, and around the external opening of this fistula there grew a little mass of granulation tissue. Soon after this second attack, in which the external auditory canal was the part principally involved, there began two separate little tumors on the anterior aspect of the pinna. I saw the patient for the first time about three weeks after the appearance of these tumors, which had then coalesced, and presented a large, dark, bluish, slightly nodulated tumor, involving the greater part of the auricle, especially the anterior surface of the concha. The tumor was associated with a considerable degree of pain and tenderness, it was of recent and rapid development, the ear had been previously healthy, and the general condition of the patient was good. Upon a close study of the history of the case, as well as a careful examination of the tumor itself, I became convinced that it was a case of that rare condition known as chondromalacosis, or hæmatoma auris, as it was

called by the older writers. Accordingly, I made a free curved incision, along the entire extent of the tumor, and including the fistulous opening below the lobule. I then curetted out thoroughly the cheesy gelatinous contents of the tumor, and found that there was marked destruction of the cartilage in certain places, which afterward led to the characteristic deformity when it healed. Now, the histological character of that little mass of granulation tissue about the fistulous opening was identical with that of round-cell sarcoma, and a diagnosis of sarcoma would have led either to the entire removal of the auricle, with such other adjacent structures as were involved, or to the absolute withholding of all surgical measures for relief. But the diagnosis of chondromalacosis led to the less radical operation, which preserved the external ear—with slight deformity, it is true, which always follows when there is any positive destruction of the cartilage itself.

PRESENTATION OF INSTRUMENTS.

EUSTACHIAN CANNULA BY DR. JOSEPH E. WILLETTS.

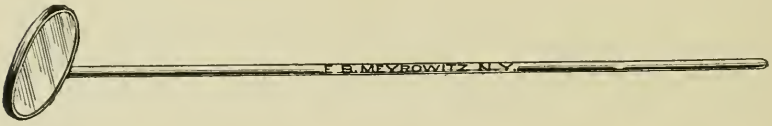
Joseph E. Willetts, Pittsburgh: On page 86 of the 1896 "Transactions" of this Society will be found a cut and description of a Eustachian cannula. Inasmuch as a number of questions have been asked concerning this instrument, I will now exhibit it. The ordinary method of treating the tympanic cavity is by forcing a solution through a catheter by means of an air-bag, but as the cavity is distended first by the air pressure, it is a question how much of the solution goes into it. The cannula, which is exhibited, is made much on the same principle as a uterine irrigator and gives a return current of air, thus allowing the entrance of the solution into the cavity. It possesses all the advantages of the Eustachian catheter, and in addition has a separate exit canal. This permits the introduction of a continuous-vapor current over the diseased area.

A NEW LARYNGOSCOPIC MIRROR AND METHOD OF USE.

BY H. HOLBROOK CURTIS.

The very great importance of getting the best view of the larynx, both in photographic work and in examinations with the stroboscope, has led me to construct a mirror which has so great an advantage over the straight-shafted, old-fashioned kind, that I wish to call attention to the model. The mirror is constructed in this manner:

Take an ordinary mirror with the shaft held down and place the left thumb on the face of the mirror, holding it firmly with the index-finger behind. Next take the shaft in the right hand and bend it twenty-two degrees to the right. Upon reversing the mirror in position for use by the right hand we find the shaft



to be on the side of the glass and quite out of the way, and that a slight rotary motion with the thumb alters the field of vision without tilting, as experienced with the old mirrors.

In operating, the glass possesses like advantage, for when used in the left hand of the operator it adapts itself to a more obtuse angle of reflection and is likewise entirely out of the way of the operator, the shaft in both cases seeking the corner of the mouth. Another recommendation for this mirror is, that the soft palate is not touched by the joint of the shaft with the mirror, and it may be used with much less irritation to sensitive throats. These mirrors may be procured at Meyrowitz or Tiemans or may be made from an old mirror as above explained.

INTUBATION WITH IMPROVED INSTRUMENTS.

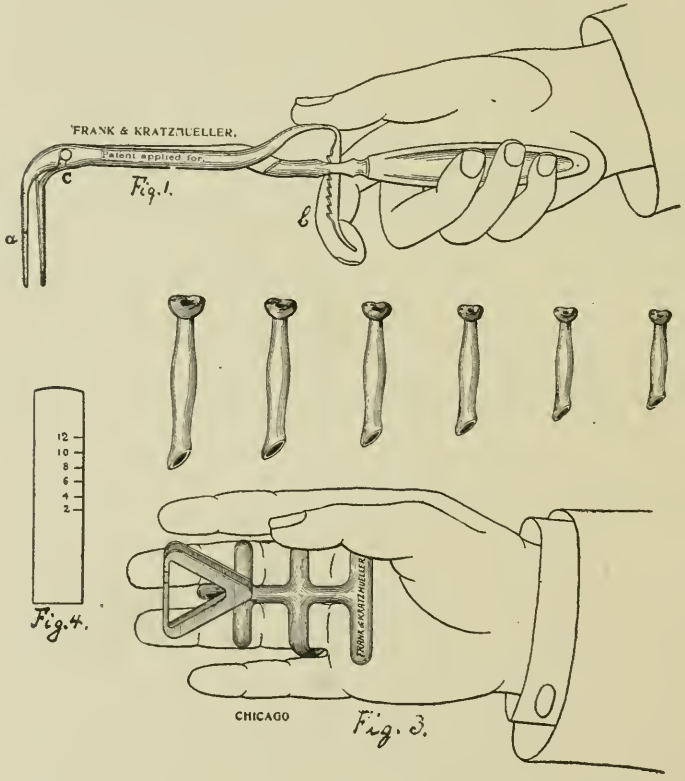
BY MAX THORNER, A.M., M.D.

In demonstrating a set of instruments which may be called improved instruments, I wish to state that I do not think the word "improved" could possibly be applied to the method of intubation itself; for when Joseph O'Dwyer gave his great invention to the world he had for five long years worked at it at the New York Foundling Asylum with such assiduity that the method was well-nigh perfected. Indeed, all possible objections and obstacles had received so much of his thought that little, if anything, had to be added, that was of importance, to the original communications of the inventor. However, those who have used the method a great deal have suggested from time to time that it might be possible to overcome some of the difficulties in the manipulation of the instruments used for intubation by making certain changes in them, whereby the method would be more facilitated. This would not in any way diminish O'Dwyer's immortal merit, nor influence the characteristics of his method. On the contrary, it was likely to advance its usefulness and appreciation of its value, for no one would think it worth while to make efforts at improving a thing of little or no value.

All of those who have had some experience, or, I should rather say, a great deal of experience, with intubation, know that at times the manipulation of the instruments may become quite difficult. One of the troublesome features is that one needs two separate instruments for either introduction or extraction of the tube. In addition, the introducer is, as you all know, quite a complicated instrument, the terminal screw of which frequently does not hold the tube firmly in the right position. Another disadvantage is that each of the six tubes requires an obturator of its own, and it not infrequently happens that the old obturators do not always exactly fit new tubes of the same size. The old extractor is likewise a complicated instrument, and everybody knows that it is not always easy, even for expert intubators, to remove the tube with the aid of it.

It has been attempted at a very early day to overcome some of these difficulties by some alteration in the instrumentarium. One

modification in the extracting apparatus, which is used a great deal, is that of Dillon Brown, which consists of a hook fastened to a thimble and a ring attached to the upper end of the tube. By this means, with the thimble placed on the right index-finger, the tubes are extracted. However, there have been a great many attempts at combining the introductor and extractor into one instrument, and to do away with the obturators, the latter having often been the cause of great annoyance to the operator and of



danger to the patient. A good many different instruments have been invented for this purpose, the description of which I will omit.

The greatest advance was made in the instrument of Ferroud, which I show here, and which is rather complicated, as it consists of seven distinct parts which cannot be readily taken apart. On the principle of this instrument, an introductor and extractor combined has been constructed by a Chicago firm,* which sur-

* Anton Frank, 56 Dearborn Street, Chicago, Ill.

passes, in my opinion, all former attempts at simplifying these instruments.

The instrument which serves as introducer and extractor (Fig. 1) has at its distal extremity two serrated beaks (*a*) about two inches long. They are opened by a pressure with the thumb on the upper portion of the lever (*b*), and are automatically held open by a ratched arrangement, while pressure with the index-finger upon the lower end (*b*) of this ratched bar relieves it and closes the beaks. By *firm* pressure the beaks hold the tube *immovably,* so that it cannot slip off nor turn during an attempt at introduction or extraction. This whole instrument consists of only two parts, the handle with one beak and the lever and ratched arrangement with the other beak (*b* and *a*), which two parts are readily taken apart by screwing the thumb-screw (*c*) towards the right. This screw has the further advantage of being so fastened to the instrument that it cannot be removed from the shank of it by unscrewing it in either direction, and, therefore, cannot be lost at a time when such a loss would frequently cause a very disastrous delay.

The tubes also have been slightly modified. While the general configuration of the tube is an exact reproduction of the original O'Dwyer tube, the top of it has been slightly changed, in that the opening has received a funnel shape, slanting from the edges of the rim of the tube towards the center. This facilitates the introduction of the beaks greatly, when the tube is in the larynx, inasmuch as it allows the beak to glide from any point of the rim almost automatically into the opening, and what this means can be appreciated by those who have had experience with the old extractor. Another change that the tubes have received is that the lower end has been cut off at an angle of about forty-five degrees, slanting from right to left. This facilitates the passage of the tube between the vocal cords, and at the same time will prevent injury to the tissues, as the knob of the obturator, which in the original tubes closes the opening of the tubes, is absent in these tubes. This absence of the obturator and its knob has the additional advantage that the air passes through the tube along the side of and between the beaks of the introducer during and immediately after introduction, a fact which contrasts with the absolute obstruction to breathing while the obturator of the old instrument is in the tube. Therefore, with this instrument the operator need not be in such a hurry to introduce the tube and to withdraw the obturator.

A mouth-gag is furnished with this set of instruments which differs from the one usually found in the set of O'Dwyer's instruments.* It consists of a wedge-shaped mouth-piece, which is fastened to two steel rings by the aid of a curved bar (Fig. 3). In using it the assistant puts two fingers of his left hand through the rings, places the wedge-shaped mouth-piece, which is well covered with rubber tubing, between the left molars, and keeps the left hand firmly pressed against the cheek of the patient. In this manner he not only keeps the mouth opened, but also steadies the head of the patient at the same time.

It can be readily seen that the method of intubation has not been altered in any degree by the use of these instruments, which will appeal to many as simplifying the manipulation to a great extent.

In conclusion, it may be added that the old tubes can be used with this new introducer and extractor as well as the new tubes.

*This mouth-gag has been devised by Dr. Henrotin, of Chicago.

BUSINESS MEETING.

The Fourth Annual Meeting of The American Laryngological, Rhinological, and Otological Society convened in Pittsburgh, Pa., on May 11, 1898, in the parlors of the Hotel Lincoln. The Society was called to order at 10 A.M. by the President, Dr. Wm. H. Daly. There were present during the sessions the following Fellows:

Wm. H. Daly, Pittsburgh, President.
Price Brown, Ontario, Can.
T. C. Christy, Pittsburgh, Pa.
Lewis C. Cline, Indianapolis, Ind.
Lewis A. Coffin, New York.
Charles N. Cox, Brooklyn, N. Y.
H. Holbrook Curtis, New York.
Ewing W. Day, Pittsburgh, Pa.
E. B. Dench, New York.
J. M. Douthett, Pittsburgh, Pa.
Thomas H. Halsted, Syracuse, N. Y.
D. A. Hengst, Pittsburgh, Pa.
J. F. Hill, Waterville, Me.
E. E. Holt, Portland, Me.
Dwight L. Hubbard, New York.
F. H. Koyle, Hornellsville, N. Y.
Robert Levy, Denver, Col.
James E. Logan, Kansas City, Mo.
John S. Mabon, Pittsburgh, Pa.
James F. McKernon, New York.
Robert C. Myles, New York.
Wendell C. Phillips, New York.
F. J. Quinlan, New York.
D. N. Rankin, Allegheny, Pa.
G. L. Richards, Fall River, Mass.
Chas. W. Richardson, Washington, D. C.
John O. Roe, Rochester, N. Y.
Sargent F. Snow, Syracuse, N. Y.
S. E. Solly, Colorado Springs, Col.
Howard S. Straight, Cleveland, O.

J. C. Thompson, Pittsburgh, Pa.
Max Thorner, Cincinnati, O.
Thomas Turnbull, Allegheny, Pa.
Henry L. Wagner, San Francisco, Cal.
M. R. Ward, Pittsburgh, Pa.
Joseph E. Willetts, Pittsburgh, Pa.

After calling the roll, the formal proceedings of the Society were opened by the address of the President.

Following the regular scientific proceedings the Society went into executive session. The following candidates, whose names had been proposed in due form by the Council, were then elected to active fellowship in the Society: Woolsey Hopkins, M.D., New York, proposed by Dr. Clemens and Dr. Myles; H. A. Alderton, M.D., Brooklyn, N. Y., proposed by Dr. Sheppard and Dr. Myles; Geo. L. Richards, M.D., Fall River, Mass., proposed by Dr. Dench and Dr. Jack; Alva E. Abrams, M.D., Hartford, Conn., proposed by Dr. Daly and Dr. Turnbull; E. J. Moure, M.D., Bordeaux, France, proposed by Dr. Daly and Dr. Curtis; E. Schimegelow, M.D., Copenhagen, proposed by Dr. Daly and Dr. Curtis; Arthur B. Duel, M.D., New York, proposed by Dr. McKernon and Dr. Dench; Dr. Sendziak, Poland, proposed by Dr. Sheppegrell and Dr. Curtis; Frederick T. Rogers, M.D., Providence, R. I., proposed by Dr. Sprague and Dr. Myles; S. Shattuck, Jr., M.D., Brooklyn, N. Y., proposed by Dr. Cox and Dr. Myles; W. C. Braislin, M.D., Brooklyn, N. Y., proposed by Dr. Cox and Dr. Myles; Price Brown, M.D., Toronto, proposed by Dr. Cox and Dr. Myles; Alexander Koontz, M.D., proposed by Dr. Curtis and Dr. Myles.

Dr. S. E. Solly, Dr. H. L. Wagner, and Dr. C. W. Richardson were appointed by the President to serve as Auditing Committee. It was voted that the President appoint a Committee of five to nominate officers for the ensuing year. The Nominating Committee was then appointed, viz., Dr. Mabon, Dr Logan, Dr. Snow, Dr. Curtis, and Dr. Holt.

Secretary's Report.

Your Secretary takes pleasure in presenting to the Society a copy of the Third Annual Transactions.

The gentlemen elected to active fellowship in the Society at the last annual meeting have duly qualified, with one exception, Dr. Samuel Mitchell of Hornellsville. Dr. Henry Lee Morse,

Boston, and Dr. J. H. Claiborne, New York, have resigned. The Society has lost by death one of its charter members, Dr. Joseph O'Dwyer of New York. Our active membership is now, with the newly elected members, one hundred and sixty-five.

Treasurer's Report.

Receipts.

Balance from 1897 account	$149 65	
From dues	580 00	
		$729 65

Disbursements.

Rooney & Otten, addressing and mailing 130 bound copies '96 transactions (stamps 9c. each)	$14 70	
Postage, Dr. Daly	5 00	
Postage stamps for programmes, letters, and part of transactions	27 62	
Geo. L. Goodman, printing programmes, letter-heads, and envelopes	52 25	
Check Dr. Hyatt, Dinner deficit	19 00	
Snyder & Black, engraving certificates, etc.	9 75	
Electrotypes	9 50	
Pusey & Troxell, and Meyer, printing	7 00	
Incidentals	8 75	
Typewriter and detail work	55 00	
Services of stenographer at Washington, May 17, 1897	50 00	
Printing and binding 500 copies transactions	257 62	
		$516 19
	$729.65	
	516 19	
Balance to credit	$213 46	

S. E. Solly,
H. L. Wagner,
C. W. Richardson,
Auditing Committee.

The Treasurer's books show a balance due from members of $505.00.

Report of Committee on Obituary Resolutions.

WHEREAS, death has removed from our midst our distinguished colleague, Dr. Joseph O'Dwyer, one of the founders of the American Laryngological, Rhinological, and Otological Society, a man of scrupulous honor and integrity, with a nature as gentle and a character as unsullied as that of the little children to the tender care of whom he devoted his life's effort; be it therefore

Resolved, That in our loss we are not alone deprived of the man whose genius has made for his name an abiding-place in medical history, but of a comrade whose modesty and sincerity will ever be remembered by those who knew and loved him.

Resolved, That in the loss of our Vice-President our Society mourns one of its most distinguished Fellows, and medical science loses one of its brightest ornaments.

Resolved, That the heartfelt sympathy of the Society be extended to the family of our lamented brother.

Resolved, That these resolutions be entered in the Archives in the American Laryngological, Rhinological, and Otological Society, and that a copy be sent to the family of Dr. O'Dwyer.

A. G. Root,
R. C. Myles,
H. H. Curtis,
Committee.

It was voted to incorporate the resolutions in the Transactions of the Society.

The Committee on Nominations reported the following names for officers for 1898-'99:

President—S. E. Solly, M.D.
Vice-Presidents—Charles W. Richardson, M. D.
Max Thorner, M.D.
Henry L. Wagner, M.D.
Charles A. Thigpen, M.D.
Secretary and Treasurer—Robert C. Myles, M.D.
Council—D. L. Hubbard, M.D.
W. C. Phillips, M.D.
Thomas H. Halsted, M.D.
John O. Roe, M.D.
W. H. Loeb, M.D.
T. C. Christy, M.D.
F. L. Jack, M.D.
W. L. Daly, M.D.

On motion the Secretary was instructed to cast the ballot, and the candidates were declared elected.

On motion of Dr. Ward, the resolution was adopted that hereafter each President shall serve as a member of the Council for three successive years after the expiration of the presidential term.

The President was called by telegram to report for duty on the staff of General Miles in the war with Spain, and Dr. S. E. Solly was asked to take the Chair in his absence.

A resolution was offered by Dr. Curtis, and amended by Dr. Phillips, that it is contrary to the best interests of the American Laryngological, Rhinological, and Otological Society to permit papers to be read either at the annual meeting of the Society, or at the meetings of any of the Sections, by persons not members of the Society, "except by special permission of the President of the Society."

It was voted that twenty-five dollars be allowed the chairman of each section to defray necessary expenses for stationery, printing, stamps, etc., for each annual section meeting.

Cincinnati was selected as the place for the next meeting by vote of the society.

After installment of the newly elected officers, the Society adjourned to meet in Cincinnati, the time to be determined by the Council.

FELLOWS.

ELECTED.

1898. Abrams, Alva E., 78 High Street, Hartford, Conn.
1895. Adams, J. L., 24 East 46th Street, New York, N. Y.
1898. Alderton, H. A., 138 Clinton Street, Brooklyn, N. Y.
1895. Arnold, J. Dennis, 530 Sutter Street, San Francisco, Cal.
1895. Bartlett, Edwin W., 422 Jefferson Street, Milwaukee, Wis.
1896. Battle, S. Westray, 13 Church Street, Asheville, N. C.
1895. Berens, Bernard, 2002 Chestnut Street, Philadelphia.
1895. Berens, T. Passmore, 101 Park Avenue, New York, N. Y.
1895. Billings, John H., 121 East 40th Street, New York, N. Y.
1898. Braislin, W. G., 217 St. James Place, Brooklyn, N. Y.
1895. Brown, Dillon, 40 East 57th Street, New York, N. Y.
1896. Browne, Lennox, 15 Mansfield, Portland Place, London, Eng.
1898. Brown, Price, Toronto, Ontario, Canada.
1897. Bulette, Wilber W., 5th and Santa Fe Avenues, Pueblo, Col.
1895. Calhoun, A. W., 62 Marietta Street, Atlanta, Ga.
1895. Chapman, S. Hartwell, 193 Church Street, New Haven, Conn.
1895. Cheatham, Wm., 303 West Chestnut Street, Louisville, Ky.
1895. Christy, T. C., Westinghouse Building, Pittsburg, Pa.
1895. Clemens, James B., 19 East 38th Street, New York, N. Y.
1896. Cline, Lewis C., 42 East Ohio Street, Indianapolis, Ind.
1897. Cobb, Frederick C., 11Marlborough Street, Boston, Mass.
1895. Coffin, Lewis A., 145 West 12th Street, New York, N. Y.
1895. Coggeshall, Henry, 102 East 57th Street, New York, N. Y.
1896. Cox, Charles N., 257 Jefferson Avenue, Brooklyn, N. Y.
1897. Crockett, Eugene A., 226 Marlborough Street, Boston, Mass.
1895. Culbert, Wm. Ledie, 118 Madison Avenue, New York, N. Y.
1895. Curtis, H. Holbrook, 118 Madison Avenue, New York, N. Y.
1895. Dabney, S. G., 216 West Chestnut Street, Louisville, Ky.
1896. Daly, Wm. H., 135 Fifth Avenue, Pittsburg, Pa.
1895. Day, Ewing W., Westinghouse Building, Pittsburg, Pa.
1895. Dench, E. B., 17 West 46th Street, New York, N. Y.
1895. Dessar, L. A., 25 West 53rd Street, New York, N. Y.
1896. Douglas, O. B., 123 East 36th Street, New York, N. Y.
1898. Douthett, J. M., 32 Westinghouse Building, Pittsburg, Pa.
1898. Duel, Arthur Baldwin, 254 Madison Avenue, New York, N. Y.
1895. Dunn, John, 314 East Franklin Street, Richmond, Va.
1895. Evans, T. C., 410 West Chestnut Street, Louisville, Ky.
1895. Fitzpatrick, T. V., 32 Eighth Street, Cincinnati, Ohio.
1895. Freeman, Walter J., 1702 Locust Street, Philadelphia, Pa.
1895. Fridenberg, Edward, 242 Lenox Avenue, New York, N. Y.
1895. Frothingham, Richard, 19 East 38th Street, New York, N. Y.
1897. Fryer, B. E., 520 East 9th Street, Kansas City, Mo.
1896. Fulton, John F., 350 St. Peter Street, St. Paul, Minn.
1897. Gildea, P. F., 2 Cascade Avenue, Colorado Springs, Col.

1896. Gougenheim, Archille, Paris.
1896. Grant, Dundas, London.
1896. Grayson, Charles P., 251 South 16th Street, Philadelphia, Pa .
1896. Green, J. Orne, 182 Marlborough Street, Boston, Mass.
1897. Grove, G. W., 206 Rialto Building, Kansas City, Mo.
1896. Gruber, Joseph, Vienna.
1895. Haddock, Chas. W., 14 Bartlett Street, Beverly, Mass.
1895. Hall, G. P., Galveston, Texas.
1895. Halsted, Thomas H., 831 University Block, Syracuse, N. Y.
1895. Hengst, D. A., 515 Penn Avenue, Pittsburg, Pa.
1895. Hepburn, Neill J., 369 West 23d Street, New York, N. Y.
1896. Heryng, T., Warsaw.
1896. Hill, J. F., 119 Main Street, Waterville, Me.
1896. Hinkel, F. W., 305 Delaware Avenue, Buffalo, N. Y.
1895. Hobbs, Arthur G., Atlanta, Ga.
1895. Hodges, R. C., 520 Travis Street, Houston, Texas.
1895. Holt, E. E., Portland, Maine.
1896. Hopkins, Wm. E., 803 Sutter Street, San Francisco, Cal.
1898. Hopkins, Woolsey, 28 West 45th Street, New York, N. Y.
1895. Hubbard, Dwight L., 117 West 93d Street, New York, N. Y.
1895. Hyatt, Franck, 1022 14th Street, N. W., Washington.
1895. Jack, F. L., 215 Beacon Street, Boston, Mass.
1896. Joachim, Otto, 124 Baronne Street, New Orleans, La.
1896. Joal, Joseph, Rue Cambaceres, Paris.
1896. Johnson, Walter B., Paterson, N. J.
1896. Karwowski, Coastantis, Warsaw.
1896. Kimball, Irving E., Portland, Me.
1896. Kinney, C. W., 117 West 93d Street, New York, N. Y.
1895. Kirkpatrick, E. A., Pleasant Street, Halifax, N. S.
1896. Knowles, W. F., Hotel Berkeley, Boston, Mass.
1897. Koyle, F. H., 1 Hakes Avenue, Hornellsville, N. Y.
1896. Kyle, D. Braden, 1517 Walnut Street, Philadelphia, Pa.
1895. Landfried, C. J., 136 Gravier Street, New Orleans, La.
1896. Lederman, M. D., 38 East 60th Street, New York, N. Y.
1897. Lester, John C., 179 Schermerhorn Street, Brooklyn, N. Y.
1895. Levy, Robert, 300 California Building, Denver, Col.
1896. Lewis, Robert, Jr., 14 East 45th Street, New York, N. Y.
1897. Libby, George F., 738 Congress Street, Portland, Me.
1895. Loeb, H. W., 303 N. Grand Avenue, St. Louis, Mo.
1895. Logan, James E., 1208 Wyandotte Street, Kansas City, Mo.
1896. Luc, H., 54 rue de Varenne, Paris.
1895. Mabon, John S., 515 Penn Avenue, Pittsburg, Pa.
1896. MacDonagh, George R., Toronto, Canada.
1896. Macintyre, John, Glasgow, Scotland.
1896. Malcolm, P. E. D., 118 Madison Avenue, New York, N. Y.
1896. Mackuen, G. Hudson, 1419 Walnut Street, Philadelphia, Pa.
1896. Martin, A., 25 rue General Foy, Paris.
1896. Martin, W. A., Spring Valley Building, San Francisco, Cal.
1897. McAuliffe, G. B., 145 East 62d Street, New York, N. Y.
1896. Mial, L. L., 145 West 12th Street, New York, N. Y.
1895. Miller, Frank E., 68 West 37th Street, New York, N. Y.

1896. Miller, Lewis H., 14 Spencer Place, Brooklyn, N. Y.
1895. Morgenthau, George, Venetian Building, Chicago, Ill.
1898. Moure, E. J., 25 bis Cours du Jardin-Public, Bordeaux, France.
1897. McKernon, James F., 116 West 48th Street, New York, N. Y.
1897. McReynolds, John O., Dallas, Texas.
1895. McShane, Augustus, 403 Baronne Street, New Orleans, La.
1897. Mullen, J. Aloysius, Houston, Texas.
1895. Munger, Carl E., Waterbury, Conn.
1895. Myles, Robert C., 46 West 38th Street, New York, N. Y.
1895. *Nichols, J. E., 4 East 43d Street, New York, N. Y.
1895. *Noyes, J. I., 53 Jackson Street, Providence, R. I.
1895. *O'Dwyer, Joseph, 967 Lexington Avenue, New York, N. Y.
1896. Onodi, Adolph, Budapest.
1896. Owsley, Frederick, 110 State Street, Chicago, Ill.
1896. Parker, Edward F., 70 Hasell Street, Charleston, S. C.
1895. Phillips, Wendell C., 350 Madison Avenue, New York, N. Y.
1896. Pierce, Norval H., 31 Washington Street, Chicago, Ill.
1896. Politzer, A., Vienna.
1895. Pooley, Thomas R., 107 Madison Avenue, New York, N. Y.
1896. Powell, Stephen C., Newport, R. I.
1898. Poyet, 19 rue de Milan, Paris, France.
1895. Quinlan, F. J., 33 West 38th Street, New York, N. Y.
1897. Rankin, D. N., 273 Western Avenue, Allegheny, Pa.
1895. Ray, J. M., 414 Chestnut Street, Louisville, Ky.
1895. Renner, W. Scott, 361 Pearl Street, Buffalo, N. Y.
1895. Reuling, Geo., 103 West Monument Street, Baltimore, Md.
1895. Richards, G. A., 36 West 33d Street, New York, N. Y.
1898. Richards, George L., Fall River, Mass.
1895. Richardson, Charles W., 1102 L Street, N. W., Washington, D. C.
1895. Roe, John O., Rochester, N. Y.
1898. Rogers, Frederick T., 117 Broad Street, Providence, R. I.
1895. Roosa, D. B., St. John, 20 East 30th Street, New York, N. Y.
1896. Root, Arthur G., Albany, N. Y.
1896. Ross, George T., 945 Dorchester Street, Montreal.
1895. Roy, C. Dunbar, Atlanta, Ga.
1895. Schadle, J. E., Lowry Arcade, St. Paul, Minn.
1895. Scheppegrell, Wm., Medical Building, New Orleans, La.
1898. Schimegclow, E., Copenhagen, Denmark.
1895. Seiss, Ralph W., 213 South 17th Street, Philadelphia, Pa.
1895. Seiler, Carl, 316 S. 15th Street, Philadelphia, Pa.
1898. Sendziak, Dr., Poland.
1898. Shattuck, S., Jr., 147 Remsen Street, Brooklyn, N. Y.
1895. Sheppard, J. E., 135 Clinton Street, Brooklyn, N. Y.
1895. Smith, S. MacCuen, 1502 Walnut Street, Philadelphia, Pa.
1895. Smith, W. Harvey, 280 Donald Street, Winnipeg.
1896. Smyly, Sir Philip, Dublin.
1896. Snow, Sargent F., Syracuse, N. Y.
1895. Solly, S. E., 2 N. Cascade Avenue, Colorado Springs, Col.
1896. Sprague, Frank B., 27 Stewart Street, Providence, R. I.

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*Deseased.

1895. Straight, Howard S., "The Hicox," Cleveland, O.
1895. Stucky, J. A., Lexington, Ky.
1896. Taylor, George A., 46 West 36th Street, New York, N. Y .
1895. Thigpen, C. A., Montgomery, Ala.
1896. Thigpen, F. M., Montgomery, Ala.
1895. Thompson, John A., 628 Elm Street, Cincinnati, Ohio.
1897. Thompson, J. C., Second National Bank Building. Pittsburg, Pa.
1895. Thorner, Max, "The Groton," N. E. Cor. 7th and Race Streets, Cincinnati, Ohio.
1896. Thrasher, A. B., "The Groton," N. E. cor. 7th and Race Streets, Cincinnati, Ohio.
1896. Tiffany, Flavel B., 1235 Grand Avenue, Kansas City, Mo.
1896. Turnbull, Thomas, 314 Western Avenue, Allegheny, Pa.
1896. Vansant, E. L., 1929 Chestnut Street, Philadelphia. Pa.
1896. Wagner, Henry L., 502 Sutter Street, San Francisco, Cal.
1895. Ward, M. R., 303 Collins Avenue, Pittsburg, Pa.
1898. Wenner, Ralph J., 1051 Superior Street, Cleveland, Ohio.
1896. Whistler, W. McNeill, 17 Wimpole Street, Cavendish Square, London.
1895. White, Joseph A., 200 East Franklin Street, Richmond, Va.
1896. Willetts, Joseph E., Westinghouse Building, Pittsburg, Pa.
1895. Winslow, John R., 924 McCullogh Street, Baltimore, Md.
1896. Wilson, Norton L., Elizabeth, N. J.
1896. Waokes, Edward, 78 Harley Street, London, W., Eng.
1896. Wolfenden, R. Norris, London.
1898. Woodward, John T., Norfolk, Va.

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